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STEEL

For forty-eight years—IRON TRADE REVIEW

January 22, 1931

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150,000 Tons of Protection In Steel

Loaded with steel and allied products of every kind, ten Ryerson plants stand ready to meet both your emergency and regular production requirements. Their huge stocks—more than 150,000 tons always on hand—make it unnecessary to maintain excessive inventories with consequent depreciation and waste. Capital is kept free for the operation and expansion of business. The diversity of stocks provides an unusual opportunity for those following a current buying program. It is easy to concentrate purchases with very definite savings in time and money.

The Ryerson Journal is the key to these stocks of steel. Let it be your buying guide. If you do not have the current copy, write and we will mail it at once.

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Rails
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STEEL-SERVICE

Burning the Covered Wagon

Order No. 17626—Burn from $\frac{3}{16}$" Armco Iron plate the covered wagon and oxen shown above. Used for a weather vane. Improved, automatic equipment makes quick, clean cuts on the most intricate designs. Especially adapted to the rapid production of duplicate pieces. Cuts any thickness up to 15 inches. Bulletin T. P. 12 shows many examples and explains the process. Shall we send it?

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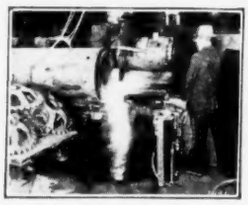


Casting Risers

An Illinois manufacturer saw a friction saw cutting structurals. He wondered why it could not be used for cutting large risers off castings they were making. He wrote to us and a special arrangement of the saw was developed to handle the job. Now they cut their risers in a fraction of the time formerly required.

A Strong Statement

We have an alloy steel that is often cheaper to use than ordinary mild steel. This is due to its extraordinary free machining qualities which cut shop costs enough to more than make up for the fractional increase in material cost. It's *Rycase*. Many are using it to advantage. Shall we send descriptive literature? Ask for Bulletin T. P. 14.

Remarkable Welding

The skill of an expert welder coupled with a hobby for fashioning artistic and useful articles produced the lamp, vase and ash tray shown above. Built completely of weldite rod deposited bead on bead by a free-hand method of arc welding. The Wilson Welder was used. We sell them; also Weldite Rod.

Volume 88 Number 4

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

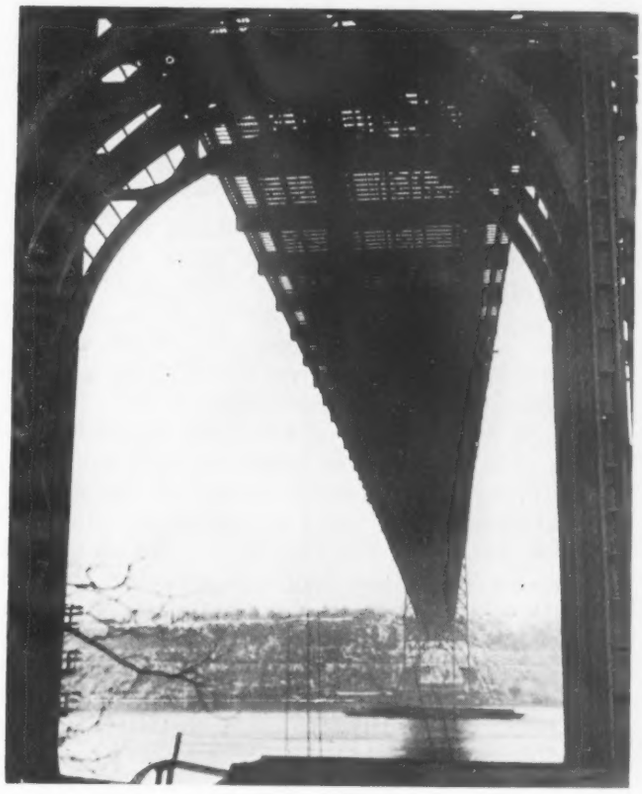
WHEN the founding fathers established congress they reasoned, with uncanny prescience, that every other year was as often as the country could stand up under a flood of legislation, and hence they ordained a biennial session to convene in December and adjourn in March in order to restrict its deliberations to government appropriation bills. But the present congress, indifferent to this limitation, sputters away on almost every topic save supply measures, and there appears to be more government in business today than at any time since the postwar adjustment. Consider only a few of the matters congress is now pursuing: A house subcommittee recommends, among other punitive measures against Russia, that its shipments of manganese to the United States be embargoed (Page 18), a senate subcommittee is weighing amendments to the Sherman act; a rider on the war department appropriation bill limits purchases of raw material to domestic products; a senate committee is considering a complete bar to all immigration for two years, while a house committee would reduce it to 10 per cent; the senate is firm for a $25,000,000 loan for the purchase of human foodstuffs, a step which some appraise as an approach to a "dole." And it is pursuing all these matters up a blind alley, unless the President weakens in his determination that congress go home March 4 and stay home.

Contend Economic Weather Is Predictable

While members of congress continue to paint the employment situation in drab colors and the last word on unemployment insurance this session has not been spoken, the President's emergency employment committee refrains from recommending legislation. Rather, in a report (Page 17), it urges that labor be given a chance through more extensive maintenance and repair, new construction, production for stock, development of new customers . . . . Much the same program with local variations is proposed by the New England Council (Page 17). . . . Says the President's committee, significantly: "Economic weather is predictable, but not with any high degree of accuracy as to the timing." . . . . Mass production of public opinion rather than mass production of machines, may account for widespread belief in technological unemployment, as one of the serious and inevitable evils of the machine age. Statistics covering more than 30 years indicate that the mechanization of industry has created new jobs faster than it has dislodged men from old ones (Page 44).

Though Slowly, Business Makes Progress

Business, meanwhile, is immune to the confusion of words as Washington maintains its balance and proceeds to make progress, slowly.



International Newsreel Photo

In this span of 3500 feet, uniting New York and Jersey and now officially designated the George Washington Memorial bridge, the variation was less than ¼-inch when the last girders were joined.

In steel, another mild rise in production is registered (Page 61), the sum of a slight, general improvement in specifying. . . . Remembering that the seasonal expectations of last fall were short-lived, the more conservative sector of the business community is eagerly watching the various tidings of betterment, but is keeping sentiment well in check (Page 27).

Look Abroad, and Feel Better

Discouragingly slow as the recovery here seems to be, there is some solace in a comparison with the European market situation. The hitherto-comfortable position of the French is deteriorating; the remainder of Europe is not improving. British steelmakers, following the lead of pig iron producers, propose to rebate $1.21 per ton to exclusive users of their products (Page 85). . . . In the shipping situation there is also considerable comfort. Shipyards on the Atlantic have not been so busy since the war, and liners under contract or certain under mail subsidies or government loans require 400,000 tons of steel over the next two years (Page 15). . . . In the automotive industry moderate gains are evident, but with genuine consumer enthusiasm not yet uncovered (Page 24). Ford has reduced dealer discounts along with retail prices. Dark colors are again the rage in automobile finishes, for one reason because they afford a better contrast with the new bright steel. . . . Ford adds 1300 acres to his upper lake iron ore lands, becoming a partner of the Steel corporation in one mine (Page 74).

Remember the Alamo—and Rusk

No matter that the United States has, giving effect to present construction, about 67,000,000 tons of steel capacity and is only producing at an annual rate of 41,000,000 tons, the urge to build, to produce, is irrepressible. Fort Worth, Tex., is visualizing itself as the seat of a great southwestern steel industry (Page 25). Texas, it will be recalled, once indulged itself in the luxury of a state-owned blast furnace at Rusk, which proved a luxury indeed to taxpayers. . . . At Newcastle, Del., the one-time plant of the Penn Seaboard Steel Corp. is to be converted into a cast iron pipe foundry, with an annual capacity of 150,000 tons, by a company in which there is a strong French interest (Page 74). This will cost Chelsea, Mass., a pipe foundry projected for there. . . . Bethlehem is moving some of its plate mills from Coatesville to Sparrows Point (Page 16).

Safety Begins With the Steel

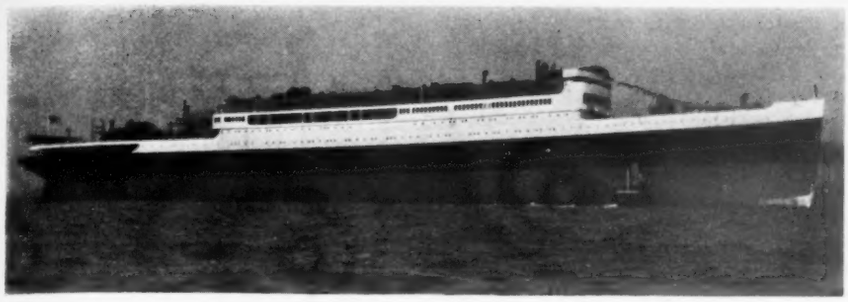
Steel used in various products of industry is full of romance that starts in the laboratory. Little thought is given to the chemist and metallurgist in their endeavor to lessen the dangers of modern mechanized life. Yet upon their skill in manipulating the test tube, microscope and X-ray machine depends safety of travel on land and sea and in the air (Page 38). . . . Bonds for furnace refractories, especially for the so-called super-refractories, have been the object of considerable research the past year, with one result that zircon is now bonded successfully, producing a refractory applicable in acid melting work (Page 47). In addition, electrically-fused magnesia has been found superior to calcined magnesia from the spalling standpoint, at least for small installations. . . . Means for obtaining the efficiency of lubricants and bearing metals under various conditions of load, speed, temperature, etc., long have been a problem for the industrial engineer. A machine for determining accurate information and suitable for industrial, power and other plants now has been devised (Page 48).

Massachusetts—With or Without Windows

Owners of the windowless Simonds Steel Industries plant, whose cornerstone was laid a few weeks ago, can afford to throw stones, but the Worcester Pressed Steel Co. cannot. In contrast to the total absence of window glass in the Fitchburg plant, the one at Worcester has 35,000 panes, these windows with structural steel studded with large rivets and painted a brilliant aluminum bronze comprising the entire exterior (Page 35). The battle of windows is on. . . . One guess as to which style of architecture the manufacturers of window shade rollers prefer! It is estimated that the shade roller industry, producing about 50,000,000 units annually, consumes about 7000 tons of steel. Springs, ratchets and pawls, and miscellaneous stampings account for a large part of the 7000 tons, but many rollers also have steel barrels (Page 42). Shade rollers for automobiles consume 450 tons annually.

If Baldwin Only Had Steel Common

With that doggedness so characteristic of the British, Stanley Baldwin, steelmaster and former prime minister, has been faithful to the metallurgical tradition of his family even in the face of a falling market. Had Mr. Baldwin jettisoned his iron and steel holdings in 1923, he would be richer today by the difference between $14.60 a share then and 40 cents now. A person having a $14.60 stake in United States steel common in 1923 would have $24.41 today, not counting regular dividends (Page 16). . . . While Mr. Baldwin is concerned over the disappearance of his wealth, Bethlehem Steel executives are troubled by their accumulations, for an action to force the return of some $36,000,000 paid them in bonuses confronts them (Page 16). . . . Formal decision to appeal the Jenkins decision in the Bethlehem-Sheet & Tube merger case has not yet been announced (Page 16).



Shipbuilding Activity Will Use 400,000 Tons of Steel

STEEL requirements for American shipbuilding now under contract or likely to come out immediately will total almost 400,000 tons, spread over the next two years, according to indications in the present renewed activity in shipbuilding.

Listing 87 steel, powered vessels, estimated to cost a total of $300,000,000, under contract or definitely foreshadowed by mail contracts already let, *Marine Review*, Cleveland, by its editor, A. H. Jansson, calls attention to the present activity of American shipbuilding. These ships range from the PRESIDENT HOOVER, shown above, which was launched Dec. 9, and the new United States liners over 700 feet in length, to a fireboat for Boston, costing $342,500.

Gross Tonnage Runs High

In the table of ships now under contract a total tonnage of 335,700 is presented. Inasmuch as approximately 40 per cent of the gross tonnage is represented by the steel in the hull, about 134,000 tons will be required for this purpose. In the ships listed as probable future contracts a total of 415,000 tons gross tonnage is presented, yielding requirements of 166,000 tons on the same basis. Machinery and other equipment for this total gross tonnage is estimated at 75,000 tons, giving a total of 375,350 tons of steel and iron in hull and equipment. Inasmuch as the gross tonnage of 18 vessels is not known, this total is short of the real steel needs for the present program.

"Every shipyard, on the Atlantic Coast at least," says Mr. Jansson, "is busier than at any time since the war. Once again the United States has embarked on a shipbuilding program destined to place us in the first rank of maritime nations. Who can tell? Maybe the period we are now going through will be noted in history as the epoch of the renaissance of American shipping. This is clear; we cannot go back to a condition of helplessness on the seas. We must build up and protect our foreign markets by sending our own goods in our own ships."

In addition to the ships mentioned in the accompanying table a large volume of work is going on. The Baltimore Mail Steamship Co. operated by the Roosevelt Line, is having rebuilding and refitting done on five ships at a cost of $7,000,000 and the American Scantic Line, on the basis of mail contracts awarded, is planning elaborate reconditioning of six Class A Hog Island type ships.

Placing the estimate of shipbuilding work definitely in sight on a basis of great accuracy, excluding those projects for which most material and equipment have been bought, the accompanying table represents ships for which none or only a portion have been covered. The new work is divided into four classes: First, ships under contract on account of mail awards as of Jan. 5, 1931; second, assured future contracts based on mail awards to date, as of Jan. 5, 1931; third, probable future contracts based on requirements of mail awards to date as of Jan. 5, 1931; fourth, recent shipbuilding contracts placed independently of mail award requirements, on which little or no work has been done up to the present.

Mail Calls for Ships

Among assured future contracts based on mail awards already made are the following:

Export Steamship Corp., 2 ships, 16,000 tons.
American-South African Line, 1 ship, 8272 tons.
Grace Steamship Co., 2 ships, 19,000 tons, bids called for.
Atlantic & Carribean Steam Navigation Co. (Red D Line), 1 ship, 8000 tons.
Dollar Steamship Lines, 2 ships, 23,000 tons.
States Steamship Co., 3 ships, 30,000 tons, bids called for.
Colombian Steamship Co., 3 ships.

Ships Now Under Contract and Building

Contracts Based on Mail Awards

Owner	Builder	Number	Gross Tonnage
Export Steamship Co.	New York Shipbuilding Co.	2	17,400
United States Lines	New York Shipbuilding Co.	2	60,000
Dollar Steamship Lines	Newport News Shipbuilding & Dry Dock Co.	2	46,000
United Mail Steamship Co. (United Fruit Co.)	Newport News Shipbuilding & Dry Dock Co.	3	22,500
Oceanic Steamship Co.	Bethlehem Shipbuilding Corp.	2	35,000
United Mail Steamship Co.	Bethlehem Shipbuilding Corp.	3	22,500
Panama Mail Steamship Co.	Federal Shipbuilding & Dry Dock Co.	4	38,000
		18	241,400

Contracts Not Based on Mail Awards

Oceanic Steamship Line	Bethlehem Shipbuilding Corp.	1	17,500
P. & O. Steamship Co.	Newport News Shipbuilding & Dry Dock Co.	1	5,000
Motor Tankship Corp.	Sun Shipbuilding & Dry Dock Co.	5	45,000
United States Navy	Newport News Shipbuilding & Dry Dock Co.	1	13,800
Standard Oil Co. New York	Sun Shipbuilding & Dry Dock Co.	2	13,000
Prof. E. R. Johnson	Bath Iron Works	1	.....
Charles H. Thorne	Bath Iron Works	1	.....
Coast Guard Service	United Dry Docks Inc.	1	.....
City of New York	United Dry Docks Inc.	1	.....
Atlantic Refining Co.	Sun Shipbuilding & Dry Dock Co.	1	.....
Gulf Refining Co.	Bethlehem Shipbuilding Corp.	2	.....
Vesta Coal Co.	Howard Shipyards	1	.....
Young Bros. Ltd.	Bethlehem Shipbuilding Corp.	1	.....
City of Boston	George Lawley & Sons Corp.	1	.....
City of New York	Todd Shipyards Corp.	1	.....
Coast Guard Service	Bath Iron Works Corp.	7	.....
		28	94,300

15,000 tons.

United Fruit Co., 2 ships, 14,000 tons.

United States Lines, 2 ships, 100,000 tons.

Oceanic & Oriental Navigation Co., 4 ships, 32,000 tons.

Tampa Interocean Steamship Co., 2 ships, 10,000 tons.

Eastern Steamship Co., 3 ships, 15,000 tons.

Bethlehem Moves Part of Coatesville Plate Mill

Philadelphia—Bethlehem Steel Co., Bethlehem, Pa., has decided definitely to discontinue its plate mills at Coatesville, Pa., which specialized in high grade steel. Machinery which can be used to advantage will be removed to other plants. One of the three blast furnaces of the company at Coatesville will be dismantled, the other two will be kept in shape for renewal of operations when conditions warrant.

Quincy Bent, vice president of Bethlehem, explained the move by stating that with the Bethlehem mills in Coatesville there was an over capacity of plate mills there in proportion to the district's consumption of plates. The Bethlehem company is expected to concentrate on its Sparrows Point, Md., plant for the making of plates.

Operations will continue at the Bethlehem tube plant at Coatesville. The Coatesville plant of Bethlehem has an annual capacity of 216,000 tons of sheared plates, 15,000 tons of flanged and dished plates, 523,200 tons of pig iron and 336,000 tons of ingots.

Retains Jobbing Mills

Chicago—Existing sheet capacity of the Inland Steel Co., at Indiana Harbor, Ind., and Milwaukee, will not be displaced by the new continuous mill to be supplied by the Mesta Machine Co., Pittsburgh. Whether additional blast furnace and open hearth furnace capacity will be added has not been determined.

The expansion program will give Inland new production in strip steel.

Chicago Machinery Dealers Deny Appraisal Plan Is Unfair to Trade

WASHINGTON — Answer has been filed with the federal trade commission by the Machine Tool Distributors, Chicago, to the complaint issued by the commission Dec. 11, 1930.

The association denies that its board of directors has any "authority or power over the members." The respondent also denies "that it employs a clerk at its headquarters, but says that it has no headquarters."

The answer states further "that the central office is no more than an information bureau and recording agency, that it exerts no control whatsoever over the members or any of them, dictates no policies, makes no recommendations or suggestions, and has no power or authority than to receive and disseminate information within the limitations as hereinabove and hereinafter stated."

It is stated further that the "central office is but a convenient name to describe the place where the records of appraisal of bids and their withdrawals are from time to time kept and maintained."

The answer states also that "this plan (Chicago Appraisal Plan) in no way affects the individual members in the sale of their new machinery and that there is no limitation, by agreement or otherwise, upon the members or any of them in regard to the kind of machinery to be sold, the territory of their operations, price maintenance, service and maintenance features, boycotting or black listing of customers or dealers, bonuses, refraining from competition or other like practices.

Respondent, further answering, "denies that any or all of the acts and things by it done have been or are to the injury or prejudice of the public and/or of the competitors of this respondent or of its members who make use of the 'Chicago Appraisal Plan,' and denies that any of its acts and doings constitutes unfair competition in commerce.

"Wherefore, respondent, reserving all rights of appeal to any order of said Commission, prays that the complaint herein against this respondent, its directors, and each of them, its executive committee, be dismissed."

In addition to the formal answer of the association separate answers have also been filed with the commission by the board of directors and executive committee of the association and by individual companies who are members of the association. All of these answers are very similar in nature to that filed by the association, which initiated the action and asked the trade commission to examine its procedure for legality.

Schwab Defends Bonus System of Bethlehem

DEVELOPMENTS in the past week growing out of the attempted merger of the Youngstown Sheet & Tube Co., with the Bethlehem Steel Corp. included:

Filing of suit in chancery court at Newark, N. J., by a small group of minority stockholders against Bethlehem and 13 officers and directors demanding restitution of $36,498,668 paid as bonuses to President Grace and others in the corporation. The stockholders claimed they did not know of the bonus payments until last summer from testimony in the Bethlehem-Sheet & Tube merger case hearing.

A vigorous defense of the bonus system by Charles M. Schwab, Bethlehem chairman, who takes full responsibility for it.

Extension of contract under which Bethlehem and Sheet & Tube were to be merged, to Jan. 27. This date marks expiration of time when appeal may be taken from decision by Judge Jenkins, enjoining the merger.

Statement by a representative of Sheet & Tube late Tuesday, Jan. 20, that no decision had been made to appeal the case.

Following the suit in chancery for return of the bonus money, Vice Chancellor Backes issued an order requiring Bethlehem and its officers to show cause Jan. 27 why they should not give an accounting. Request for an injunction to restrain the corporation from making further bonus payments was refused.

"Responsibility for the Bethlehem profit-sharing plan is entirely mine," declared Mr. Schwab. "As well known, the system has been approved by our stockholders and with their consent its operation has been delegated to me. I have never personally participated in the distribution so that I might be entirely free from all possible prejudice in fixing the relative participations of the men who were compensated.

"I shall continue to exercise my best judgment so long as our stockholders and directors shall continue the power in me. The Bethlehem profit-sharing system has resulted to its great advantage, and I shall defend it with my stockholders who may question its propriety."

Baldwin, Holding Steel Stocks, Loses Fortune

Stanley Baldwin, former prime minister of England, disclosed recently that the depreciation of his holdings in the iron and steel industry of Great Britain has been so great that some of his holdings, worth in 1923 about

$14.60 per share, were now valued at 40 cents.

"I nailed my flag to the mast of British industry," he said, explaining that members of the Baldwin family had been engaged in the iron and steel business since the reign of Charles II.

(Editor's Note: Had Mr. Baldwin in 1923 exchanged his English shares for common stock of the United States Steel Corp., even at the year's high, for every $14.60 then he would have today $24.41, excluding regular dividends.)

Says Economic Weather Can Be Predicted

Washington — "Our economic knowledge is such that no one can yet prophesy with accuracy just when a boom is going to break or just when a slump is going to end," Edward E. Hunt, secretary of the President's emergency employment committee, said in a recent statement. "The economic weather is predictable," he said, "but not with any high degree of accuracy as to the timing.

"I know of no way in which to increase our knowledge and hence our influence over economic conditions except by hard, continuous study of probable causes and effects and continuous attempts at control."

Farrell Deplores Talk of Possible Wage Cuts

James A. Farrell, president, United States Steel Corp., in addressing the National Canners' association at Chicago, Jan. 19, declared "the low point of the business depression was passed thirty days ago."

Taking issue with financial men who urge wage cuts, Mr. Farrell asserted that general reduction in wages would set back impending recovery in this country by at least two years. Relief given to the unemployed and general adherence to fair wages undoubtedly have hastened impending recovery, Mr. Farrell added, and went on to express his belief that buyers and manufacturers must be persuaded that their prime interest lies not in frugal inventories and hand-to-mouth purchases. The tariff should be no bar to returning business, Mr. Farrell believes.

Fence Standard Continued

Washington—The simplified practice recommendation on woven wire fencing and fence packages has been reaffirmed without change for one year. The average degree of adherence to the recommendation is approximately 98 per cent.

Renew Equipment To Aid Labor, Hoover Board Urges

A SOUND source of unemployment relief is to be found in activities associated with repairs, renewals of machinery and maintenance, according to a survey prepared by executive of certain large industrial companies at the request of President Hoover's emergency committee. About one-third of the companies having an unemployment problem are reported to have proceeded with work of this nature which otherwise would have been postponed.

The committee also has had prepared an "Outline of Industrial Policies and Practices in Time of Reduced Operations and Employment." The outline is said to be based upon many reports coming to the committee from progressive companies.

Under "Methods of Spreading Employment" the committee suggests: Reduced weekly schedule, reduced daily schedule, shorter shifts in continuous operation, alternating shifts or "staggering," and rotation of days off.

These methods are suggested for increasing work available: More extensive maintenance and repair, accelerated replacement of machinery, construction, production for stock, development of new products and new customers.

Analysis of payroll and a survey of personnel are advised as a basis for lay-off procedure. This should disclose the persons willing to go on furlough without pay; duplication of wage earners in the same family unit in the company's employ; need for earnings as indicated by the number of dependents and home responsibilities: adequacy or inadequacy of part-time earnings, and persons to whom assurance can be given as to the security of their employment.

Permanent policies for stabilization of earnings and employment are discussed in the committee's report, including: Forecasting and planning, broader training of new employes, standardization of products, guaranteed employment, unemployment insurance and an elastic workday or week.

New England Council Gives Employment Formula

Reduction of unemployment has two phases, the immediate which calls for action to avoid and alleviate distress, and the long-time, requiring adoption and development of policies making for steady operations, the New England council's industrial committee reports. This group of manufacturers, with headquarters at Boston, has outlined a program. Overhauling machinery and equipment and modernizing plants are in the list of immediate measures.

Long-time measures are: Plan and budget sales, production and profit; establish adequate standards of quality, value, and especially performance, with suitable rewards for attainment and maintenance; merchandise aggressively; adopt or extend research; and improve employe morale.

STEEL BEST FOR LOW BUILDINGS, TOO!

Skyscrapers have no exclusive call on steel for even the one-story gas and service station is best built of this enduring metal. The Columbian Steel Tank Co., Kansas City, Mo., built this superstation for the Baker Oil Co., at Little Rock, Ark. The building is 28 x 80 feet. The flat panel effect is relieved by fluted Doric steel columns.

Value of Nation's Iron Ore Output Shrinks $51,260,000 in 1930

IRON ore shipped by producers in the United States in 1930 had a total value of $145,888,000 at the mines, $51,260,640 less than the ore shipped in 1929. Total shipments in 1930 were 55,094,000 gross tons, compared with 75,602,734 tons in 1929. The decrease in tonnage was 27 per cent, and in total value 26 per cent.

About 84 per cent of the ore in 1930 came from the Lake Superior district. The value of the 46,411,000 tons of lake ore, excluding 801,000 tons containing 5 per cent or more of manganese, was $126,026,000, a reduction of $48,197,266 from 1929.

The average value of the Lake Superior ore at the mines in 1930 was $2.72 per gross ton, 4 cents more than in 1929. This increase probably is due to a slight improvement in the percentage of iron as market prices were unchanged.

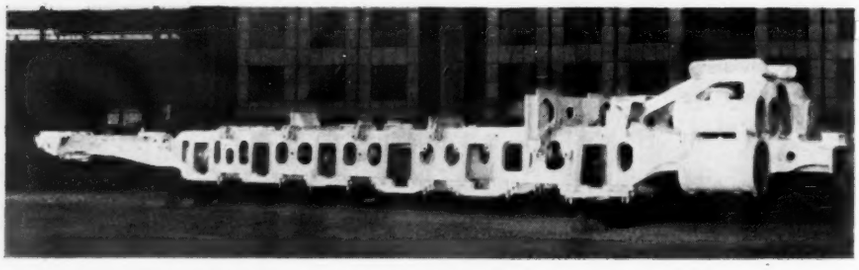
The average value of the ore produced in the southeastern states last year was $1.94 per gross ton, 78 cents less than that in the Lake Superior district. The average value at mines in the northeastern states was $3.61. Most of the northeastern ore is magnetite and is concentrated at the mines, accounting for the fact the value was 89 cents a ton higher than that in the Lake Superior district.

The foregoing figures and those in the accompanying table are from a current report by the bureau of mines. Shipments for 1930 are estimated.

Shipments and Mine Values for Two Years Compared

District	1929 Gross tons	1929 Value	1930 Gross tons	1930 Value
Lake Superior:				
Michigan	16,838,568	$47,597,976	11,262,000	$32,248,000
Minnesota	46,470,243	121,776,312	34,000,000	90,598,000
Wisconsin	1,789,721	4,848,978	1,149,000	3,180,000
	65,098,532	174,223,266	46,411,000	126,026,000
Southeastern states:				
Alabama	6,637,299	12,575,113	5,607,000	10,586,000
Georgia	59,316	175,145	53,000	149,000
Missouri	171,456	661,055	127,000	482,000
North Carolina	30,575	106,411	.....	.....
Tennessee	101,796	234,827	28,000	75,000
Virginia	232	631	36,000	57,000
	7,000,674	13,753,182	5,851,000	11,349,000
Northeastern states:				
New Jersey	285,115	1,157,848	387,000	1,686,000
New York	875	3,941,985	752,000	3,647,000
Pennsylvania	1,151,130	2,382,839	894,000	2,012,000
	2,311,809	7,482,672	2,033,000	7,345,000
Western states	1,191,719	1,689,520	799,000	1,168,000
Grand total	75,602,734	$197,148,640	55,094,000	$145,888,000

Note—Total shipments for 1930 estimated by bureau of mines.



MODERN DRAGON'S SKELETON IS OF STEEL

This steel frame for a locomotive was cast by the General Steel Castings Corp., Commonwealth division, Granite City, Ill. It has provision for six sets of drivers and three cylinders, is over 60 feet long and weighs 82,000 pounds finished. More than 130,000 pounds of steel was poured to obtain the rough casting. This frame affords a unit on which to hang the boiler, firebox and wheels and then we're off. First glance at the picture calls up visions of Chinese dragons.

The Business Week in Washington

FOURTEEN recommendations have been proposed by the Fish committee, which has been investigating communistic activities in the United States. One proposal is that congress immediately consider a complete embargo on imports of Russian manganese ore.

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Panama canal office states tolls through the canal for 1930 totaled $26,106,900. Only 5875 commercial ships went through the canal in 1930, fewest since 1926.

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Senate confirmed Edgar F. Brossard and Lincoln Dixon as members of the tariff commission, completing the confirmation of the entire new board.

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An amendment has been placed in the war department appropriation bill in the house providing that raw materials used in supplies purchased by the army must originate in the United States.

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President Hoover's emergency employment committee announces that within the past 100 days public construction totaling $700,000,000 has been financed, including cities, states, and townships.

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Resolution of Senator Reed, of Pennsylvania, providing for a two-year prohibition of immigration has been placed in the hands of a subcommittee of the senate committee on immigration. There is a general approval of the plan in congress.

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Senators King, Robinson and Hastings comprise a subcommittee of the senate judiciary committee to conduct hearings on changes in the Sherman antitrust law. Two bills in the senate and one in the house would amend the law.

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Department of labor states that in December there was a "below average" employment trend. The department calls attention to the building funds, both public and private, which are now available, and indicates that this will help.

Attend Regional Meeting

Birmingham, Ala. — Some 260 foundrymen were registered at the Southern Regional conference of the American Foundrymen's association at Hotel Tutwiler, Jan. 20-21. Many represented northern foundry interests. A lively interest was shown in the papers presented, and discussion of foundry problems.

Overhead Crane Business Shows Effect of Depression

REFLECTING generally depressed industrial conditions, bookings of overhead electric crane equipment dropped sharply in 1930, both in units and dollar value, according to the Electric Overhead Crane institute, New York. New orders totaled 791 units with a capacity of 13,045¼ tons, valued at $7,070,239.81. This compares with 1689 units booked in 1929, which were valued at $14,618,319.45, and represents a reduction of more than one half both in orders and value.

A better showing is made in shipments, due to the fact that backlogs with builders at the start of 1930 were large. During the period under review 1020 units were shipped, valued at $10,079,843.14, compared with 1929 shipments of 1565 units valued at $12,290,629.05. While new orders increased slightly in December, 1930, the value of such orders was below those placed in November, and backlogs of unfilled orders on Jan. 1, 1931, were far below those of one year ago. The accompanying table gives comparative figures on orders and shipments, as well as dollar values, for 1929 and 1930.

Sell Most Springs Direct

Manufacturers of steel springs sell 65.7 per cent or $30,311,000 worth of their product direct to industrial consumers, according to the 1929 census of manufacturers by the department of commerce. Sales to wholesalers totaled $14,386,000, or 31.2 per cent of the total. Total spring sales were $46,171,000. Of the remainder 2.4 per cent, or $1,134,000 to retailers and 0.7 per cent to manufacturers' wholesale branches. The census finds 94 establishments engaged primarily in the manufacture of steel springs.

Machine Tool Orders Improve in December

Machine tool orders' index rose from November's low of 60.4 to 65.2 for December, not so much for the larger companies in the "A" group as for the "B" and "C" companies. Index of orders for 1930 is 127.8, compared with 281 for 1929 and 236.6 for 1928. Shipments increased in December over November. For the year, index of shipments is 152.6, compared to 284.6 for 1929. As 1931 began, index of unfilled orders was 203, down 64 per cent from a year ago, according to the National Machine Tool Builders' association, Cincinnati, whose compilation for three-month orders follows:

1929	*Index A	*Index B	*Index C	Total
Dec. ...	224.0	212.7	258.3	222.1
1930				
Jan. ...	173.8	171.9	226.8	175.4
Feb. ...	170.3	169.1	213.6	172.6
March	172.8	184.0	219.7	177.8
April ..	167.6	197.7	214.4	176.8
May	155.2	191.2	195.3	165.1
June ...	137.6	171.6	169.4	146.7
July	106.6	146.5	146.9	117.3
Aug. ..	100.8	137.0	138.0	110.2
Sept. ..	103.5	139.0	156.0	113.6
Oct. ...	104.4	135.0	151.0	113.3
Nov	89.0	106.3	143.5	95.5
Dec. ..	65.2	90.9	113.8	73.1

*Note—Index A, base over $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but the sum of each item in percentage of the total base.

Sheet Sales Increased; Output Lower in December

Daily average sheet sales by independent mills in December increased 75 per cent from November; production decreased 5 per cent, and shipments dropped 11 per cent. Total sales for December were 233,289 tons, production 145,125 tons, and shipments 144,040 tons.

The National Association of Flat Rolled Steel Manufacturers, Cleveland, reports unfilled tonnage as of Jan. 1 was 378,601 tons; approximate finished stock on hand awaiting shipment, 100,961 tons; and approximate in stock unsold, 83,629 tons.

Total sheet capacity in the United States for December was approximately 539,800 tons, and the capacity on which the foregoing figures are based is 364,950 tons.

Foundry Equipment Decline Halted at Year's End

December index of foundry equipment orders snapped back from the low of November and stood at 59.8, according to 19 reports made to the Foundry Equipment Manufacturers' asssociation:

	1927	1928	1929	1930
Jan.	180.4	132.7	180.5	160.1
Feb.	198.0	123.6	197.0	196.4
Mar.	131.1	138.6	209.4	164.1
Apr.	130.0	107.7	172.6	122.8
May	134.8	335.6	177.7	92.7
June	138.4	149.1	177.3	102.1
July	89.9	94.8	219.3	90.6
Aug.	106.4	278.0	229.5	85.2
Sept.	80.4	170.0	216.3	91.0
Oct.	98.0	185.0	245.3	50.0
Nov.	95.8	197.8	128.6	45.3
Dec.	106.8	166.5	208.0	59.8

Base: Average monthly shipments for 1922-23-24 taken as 100.

Locomotives Up for Month

December shipments of railroad locomotives from the principal manufacturing plants totaled 49 locomotives, compared with 43 in November and 67 in December, 1929, according to the department of commerce. Total shipments for 1930 were 763; for 1929, 846; and for 1928, 489. Following are monthly reports:

	Shipments		Unfilled Orders	
1929	Domestic	Foreign	Domestic	Foreign
Dec.	63	4	483	7
(Year)	742	104	.....	.....
1930				
Jan.	48	.....	577	10
Feb.	64	3	525	8
March	66	2	529	6
April	94	3	461	3
May	56	2	410	9
June	80	1	335	8
July	55	1	284	7
Aug.	73	4	229	5
Sept.	65	.....	169	5
Oct	50	.....	127	5
Nov.	43	.....	88	5
Dec	44	5	104	.....
(Year)	739	24	.....	.....

Overhead Crane Business Statistics

	New Orders				Shipments			
	1930		1929		1930		1929	
	Units	Value	Units	Value	Units	Value	Units	Value
Jan.	56	$405,707.36	173	$1,383,257.70	104	$977,078.89	107	$851,514.34
Feb.	91	832,357.45	149	1,172,850.60	95	773,068.05	97	585,986.10
March	108	850,658.50	199	1,918,720.40	107	1,058,761.76	113	772,609.10
April	83	882,358.81	149	1,193,647.85	106	825,326.50	107	748,367.40
May	72	595,855.00	181	1,456,541.80	100	879,442.31	134	1,122,014.90
June	71	740,866.70	152	1,189,046.86	92	956,366.85	150	1,091,228.20
July	70	601,333.00	126	1,156,843.45	90	1,005,446.35	145	1,146,264.00
Aug.	54	522,011.00	124	1,164,989.95	80	728,923.00	140	1,059,946.66
Sept.	52	614,070.00	89	700,972.50	69	941,570.00	141	1,048,054.10
Oct.	45	352,680.75	134	1,142,216.00	66	676,649.00	152	1,322,118.30
Nov.	41	370,443.25	132	1,404,994.45	60	586,503.75	131	1,162,204.50
Dec.	48	301,899.00	81	734,237.89	51	670,706.68	148	1,380,321.45
Total	*791	7,070,239.81	1689	14,618,319.45	1020	10,079,843.14	1565	12,290,629.05

*Tonnage capacity 13,045¼.

Industrial Men in the Day's News

Don L. Brown, New President, Pratt & Whitney Aircraft Co.

FROM an apprenticeship in a steel mail box riveting shop he has risen to be head of world's largest exclusive airplane engine plant.

HIS airplane motor experience for the French government fitted him admirably for his wartime effort for the United States, in charge of assembly for the Wright-Martin Co.

AFTER automobile and steam engine work, he returned to aircraft with F. B. Rentschler, whom he now succeeds.

FOLLOWING a rapid rise in engine production, Don L. Brown as noted in STEEL of Oct. 23, 1930, was elected president of Pratt & Whitney Aircraft Co., Hartford, Conn., in charge of the plant said to be the world's largest devoted exclusively to airplane engine manufacture.

Born in Berlin, Wis., in 1890, his business experience since has been almost entirely in the industrial production field. After completing high school in his home town he entered as an apprentice in the small shop of Peck Hamre Mfg. Co., Berlin, making riveted steel mail boxes. Thus he started his association with steel products which, with few interruptions, has since continued.

A year later he went to Chicago, where he made a connection with Illinois Steel Co., South Chicago. He worked for three years in various divisions of the open-hearth department and attended night school at the school of commerce, Northwestern university. He left Chicago to become affiliated with the production and planning department of Simplex Automobile Co., New Brunswick, N. J., then engaged in building Hispano Suiza airplane motors for the French government for use in World war planes. Mr. Brown advanced steadily in the motor division, and in 1917 when the company was reorganized as the Wright-Martin Co. he had charge of the assembling department.

Soon after this the company absorbed the General Vehicle Co., Long Island City, N. Y., and at the close of the war, Mr. Brown accompanied W. P. Anderson to Olds Motor Works, Lansing, Mich., as production manager. He left to become production manager for Houston-Stanwood & Gamble Co., Covington, Ky., manufacturer of steam engines. In 1921, however, he returned to the aircraft engine field with F. B. Rentschler, at that time president and general manager of Wright Aeronautical Corp. Mr. Brown was placed in charge of production and later became assistant factory manager. He resigned in 1925 to go with Mr. Rentschler and to aid in developing Pratt & Whitney Aircraft Co., Hartford. Since then, in addition to his work in engine production, he supervised the design and construction of the company's new plant in East Hartford.

He is an ardent airplane enthusiast and recently had a breakfast engagement in Cleveland, flew to Hartford for luncheon, and played golf there that afternoon. His chief hobby, next to flying, is horseback riding.

G. H. WAITE, identified with American Steel & Wire Co., for about 20 years, has been appointed manager of sales at Kansas City, Mo., to succeed the late Maj. J. M. Holloway. Mr. Waite spent 18 years for the company at Denver, rising to be assistant manager of sales in that territory. Two years ago he was transferred to Kansas City as a member of the sales organization.

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Herbert A. May, who as noted in STEEL of Jan. 8, has been appointed assistant to F. A. Merrick, president of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has headquarters in the Grant building, Pittsburgh. He is a director of Mackintosh-Hemphill Co., Pittsburgh Steel Foundry Corp., Pittsburgh Aviation Industries Corp., Forbes National bank, all of Pittsburgh; Union Drawn Steel Co., and Farmers National bank, Beaver Falls. Pa., and Davidson Ore Mining Co., Buffalo.

Malcolm Carrington, formerly director of finished stocks, Westinghouse company, East Pittsburgh, since 1926, has been appointed assistant to the vice president. He will have general supervision of shipping stocks, order procedure and office management.

Thomas S. Perkins, formerly manager of supply engineering and consulting engineer, was made general manager of distribution engineering. Other appointments follow:

R. W. E. Owens, manager of industrial motor engineering, is made

general manager of industrial engineering.

W. M. McConahey is appointed consulting engineer at Sharon, Pa. H. V. Putnam succeeds Mr. McConahey as manager of the trasnformer engineering department.

M. S. Hancock is appointed assistant manager of the industrial motor engineering department and R. E. Marbury is made assistant manager of the supply engineering department.

A. S. Duncan is appointed manager of shipping stocks and H. C. McElhone is assigned to duties in connection with the analytical reviews of office operations.

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C. H. Brunke has been appointed Toronto, Ont., manager for United States Steel Products Co., New York, in succession to F. C. Brunke, resigned.

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Russell St. John has been elected president of the Canadian Equipment Co., Montreal, Que., to succeed the late Burton Wyman St. John, whose death was reported in STEEL of Dec. 25, 1930.

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Roy I. Morrison, general sales manager of Buffalo Tank Corp., Buffalo, has been elected a vice president and a director, to succeed Sylvester A. Collins, resigned. All other officers were re-elected.

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John Stevenson has been appointed general superintendent of the Brooks works of American Locomotive Co., Dunkirk, N. Y., to succeed Charles A. Schrader, resigned. Mr. Stevenson formerly was with American Car & Foundry Co., New York.

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W. J. Crowe, rolling mill engineer, and Louis A. Deesz, fuel and gas engineer, have become affiliated with Freyn Engineering Co., Chicago, and will be located near Moscow, Russia, in connection with that interest's steel mill project in Kuznetsk, Siberia.

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J. L. Sussman, head of Pipe & Tube Products Corp., New York, has returned from several weeks trip to England, Germany, Belgium and the Netherlands, visiting leading steel works. He spent much time at the plants of Tubes Ltd., England, where he studied a new process of electric welding of hot rolled strip.

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John F. Galvin, president of Metal Stamping Co., Long Island City, N. Y., has been re-elected chairman of the Port of New York Authority, of which he has been commissioner since 1923. This body has charge of large engineering projects in New York city and northern New Jersey, including Hudson river bridge at Fort Lee and Bayonne-Staten Island bridge. Other plans under way call for the expenditure of several million dollars.

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C. H. Keeney, identified with foundry equipment manufacture for about 25 years, has been appointed sales manager for Northern Blower Co., Cleveland, manufacturer of sand blast rooms, core ovens, air separators, exhaust systems, etc.

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Norman C. Cooper, mill manager of the Container Corp. of America, Kokomo, Ind., succeeded Arthur C. Mooro on Jan. 15 as superintendent of the Circleville, O., plant. Mr.

R. R. Wason

Who, as noted in STEEL of Jan. 15, was elected president of Manning, Maxwell & Moore Inc., New York, in succession to C. A. Moore, now board chairman

Moore had been in that position for about four years.

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John H. McCormick has resigned as president of Lycoming Mfg. Co., Williamsport, Pa., castings, motors, etc. He has been with the company since 1908, serving as president since 1926. He has devoted much time to the development of 8-in-line automobile motors.

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F. L. Morse has been elected president of Morse Chain Co., Ithaca, N. Y., a division of Borg-Warner Corp., Chicago. F. C. Thompson has been elected first vice president and general manager, and D. B. Perry, second vice president and secretary. C. J. Kenerson is treasurer.

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T. T. Craine, of Steubenville, O., has been appointed general manager of sheet mills of the Weirton Steel Co., Weirton, W. Va., and Steubenville, to succeed Russell Horne, who resigned to assume similar duties at Canton, O., for Republic Steel Corp., Youngstown, O.

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Samuel Wyres, identified with Brainard Steel Corp., Warren, O., for some time, has been promoted to be general plant superintendent.

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Paul W. Stewart has been added to the staff of A. O. Smith Corp., Milwaukee, to organize and direct a department of economic research. Mr. Stewart, a graduate of the University of Pittsburgh, school of business administration, has for seven years been engaged in economic and market research in the department of commerce, Washington.

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Ben R. Mayne, former general manager of Saginaw Malleable Iron division of General Motors Corp., Saginaw, Mich., has been elected a vice president of the American Malleables Co., a division of the American Brake Shoe & Foundry Co., New York. He will continue to live in Saginaw and will maintain offices in Detroit and Owosso, Mich., devoting his time principally to the malleable iron foundry at Owosso. Mr. Mayne has been identified with the Saginaw Malleable company since it was organized 13 years ago. He became general manager in 1927.

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C. B. Murphy has been appointed manager of stationary diesel engine sales for Fairbanks, Morse & Co., Chicago. Most of Mr. Murphy's experience since graduating from Purdue university in 1911 has been in the Fairbanks-Morse organization. In 1913 he was general line salesman in Florida west coast territory but since the introduction of the company's diesel engine in 1915 he has devoted his time to that product exclusively, with time out in 1918-19 for war service. He was transferred in 1924 to the company's executive offices as assistant to the manager of the diesel engine division, and in 1929 was transferred to Washington as special representative of that division.

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Burt B. Brewster, for 14 years intermountain manager of Sullivan Machinery Co., Salt Lake City, Utah, has been appointed manager of Illinois, Indiana and Kentucky territories with headquarters at St. Louis and Mt. Vernon, Ill. He has been with the company for 20 years. He was graduated from the Michigan college of mines in 1911 and started to work for the Sullivan company at St. Louis in 1912. He remained there for more than two years, being transferred to Juneau, Alaska, in 1914. In 1916 he was made manager of Utah, Idaho, Nevada and western Wyoming, with headquarters at Salt Lake City, where he now is succeeded by O. S. Neslage, formerly manager at Mexico City.

Obituaries

HOLLINSHEAD N. TAYLOR, 51, former president of the N. & G. Taylor Co., Philadelphia, with tin plate mills at Cumberland, Md., now associated with Corrigan, McKinney Steel Co., Cleveland, died suddenly in Philadelphia, Jan. 15. Born in Philadelphia in 1879, he was educated at Germantown academy and the University of Pennsylvania. After graduation in 1901 he became affiliated with the Taylor company, of which his father was head, whom he later succeeded. He later was succeeded in the presidency by William McLean but remained identified with the company. For two years Mr. Taylor was chairman of the committee on simplification of terne plate of the department of commerce. He served for 12 years as president of the Drop Forge Supply association. He was president of Taylor-Offut Coal Co. and director of Copper Plate Sheet & Tube Co. He also had been vice president and director of Philadelphia's chamber of commerce, serving on many of its committees, including aviation, joint executive committee on harbor improvements, public utilities, industrial, finance and executive. He was a member of the Society of Automotive Engineers, American Iron and Steel institute, Franklin institute and many other clubs and societies.

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Edgar Benham, 55, vice president of Mosler Lock Co., Covington, Ky., died recently.

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Hugh Johnston, 55, president of Dominion Steel Equipment Ltd., Toronto, Ont., died recently.

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Rudolph R. Bauerle, 91, formerly with Bauerle & Morris Inc., Philadelphia, machinery, died Jan. 9.

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Arthur W. Boyd, 62, traffic manager, Union Drawn Steel Co., Beaver Falls, Pa., died Jan. 10, at his Beaver, Pa., home.

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Leo Hoefinghoff, 69, for 40 years with the foundry firm of Hoefinghoff & Laue Co., Cincinnati, died recently. He retired several years ago.

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George J. Potts, 40, president of C. & G. Potts Co., Indianapolis, operator of a foundry, died Jan. 9. The firm was founded by his father and he had been president six years.

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Richard W. Donigan, 76, president of Todd-Donigan Iron Co., Louisville, Ky., until his retirement about a year ago, died in that city. He first was employed by American Rolling Mill Co. and later by Belknap Hardware & Mfg. Co., but became identified with the Todd-Donigan Iron Co. at its organization in 1881, being its president for 20 years.

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W. R. R. La Vielle, 54, chairman, Neill-La Vielle Supply Co., Louisville, Ky., jobber of mill supplies, machine shop and conveyor equipment, died Jan. 4.

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Charles A. Draper, who retired a year ago after 49 years service as purchasing agent for New York, Ontario & Western railroad, died Jan. 6 at Stamford, Conn.

Hollinshead N. Taylor

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Harry Lee Van Zile, 66, president of Van Zile Ventilating Co., New York, died Jan. 7. He was a native of Troy, N. Y., and a graduate of Rensselaer Polytechnic institute.

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Pelle Anderson, engineer in charge of the steam engine department of Allis-Chalmers Mfg. Co., Milwaukee, died Jan. 10. Born in Sweden he came to America in 1892, and had been associated with Allis-Chalmers company for 27 years.

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Harry A. Hammond, 59, for many years New York representative of General Cable Corp., New York, died Jan. 1. He was connected with Rome Wire Co., Rome, N. Y., before it became a division of the General Cable Corp.

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Carl H. L. Flintermann, 54, president of Wilcox-Rich Corp., Detroit, subsidiary of Eaton Axle & Spring Co., Cleveland, died in Jackson, Mich., Jan. 18. He was chairman of the pressed steel division of the war industries board during the World war.

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Willard Armstrong, secretary, Mt. Vernon Bridge Co., Mt. Vernon, O., died recently.

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Ernst H. Huenefeld, 92, president of the Huenefeld Co., Cincinnati, manufacturer of sheet metal products, died there last week.

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Clifford Hubbell, 63, vice president of Seneca Iron & Steel Co., Buffalo, died Jan. 17. Mr. Hubbell formerly was president of several of Buffalo's largest banks but in recent years had devoted his entire time to the Seneca corporation's Blasdell works.

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T. Broom Belfield, 82, who most of his life was identified with H. Belfield & Co., Philadelphia, iron and brass founders, but who retired in 1908, died Jan. 5. He was director of the Franklin institute and many philanthropic organizations.

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Wilbur S. Sample, 58, designer in structural steel for many years, died recently in Pasadena, Calif. He formerly was with **Thompson-Starret** Co. Inc., in Chicago, and represented the George A. Fuller Co. in Canada and in the Orient.

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Orton Lee Prime, president of Prime Mfg. Co., Milwaukee, railroad supplies, died Jan. 14 at Rochester, Minn. He was born in Milwaukee in 1875 and established the railroad supply plant in 1906. For many years was also associated with Prime Steel Co., operating a steel foundry, since discontinued.

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Roy J. Peterson, 45, assistant superintendent of the foundry at the Farmall works, of International Harvester Co., Rock Island, Ill., died Jan. 13. He was born at Moline, Ill., in 1885. He had been with the International company for the last five years, having been located at Rock Island for three years.

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William C. Farnum, 82, who for about 25 years was superintendent of Miltmore Elastic Steel Car Wheel Co., Arlington, Vt., but latterly operated an experimental shop at Ilion, N. Y., died Jan. 5. at Marlboro, Mass. At one time he was with Walter A. Wood Mowing & Machine Co., Hoosick, Falls, N. Y., inventing and designing machinery. He also was with Canadian Pacific railroad at Montreal, Que., designing railway appliances.

Here and There in Industry

LINK-BELT CO., Chicago, has appointed McFarland Tractor & Equipment Co., St. Joseph, Mo., its agent for the sale of cranes, shovels, drag lines and other Link-Belt company equipment for the territories of Atchison and Doniphan counties in Kansas, and 17 counties in northwestern Missouri, tributary to St. Joseph. Kirk McFarland is president of the McFarland Tractor & Equipment Co. and he is assisted by A. W. Hall and Ed. H. Wolter. This company is active in the highway and construction industry.

Link-Belt Ltd., Toronto, Montreal and Vancouver, E. C. Burton vice president, announces the appointment of sales representatives in western Canada. In Manitoba and Saskatchewan the Link-Belt company will be represented by Manitoba Bridge & Iron Works, Ltd., Winnipeg, which has sales offices in Calgary and Regina, and operates foundries, structural and machine shops and rolling mills. Riverside Iron Works Ltd., Calgary, will represent Link-Belt company in southern Alberta. This company operates gray iron and steel foundries and structural and machine shops and has been active in general industrial lines and in the coal and oil fields.

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Nu-Way Machine & Die Works, St. Louis, has moved from 2353 Chestnut street to 1235 Piggott avenue, East St. Louis, Ill.

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Highway Trailer Co., Edgerton, Wis., has purchased the Martin Trailer Co., Springfield, Mass. The Martin company has been operating under a receiver for some time.

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Globe Steel Abrasive Co., Mansfield, O., recently put into operation an addition doubling capacity. The installation was designed by the Globe Steel Co.

□ □ □

John L. Wolfrom has opened offices in the Loew's State Theater building in Syracuse, N. Y., and is organizing the Wolfrom Canning Machinery Co. to deal in canning machinery.

□ □ □

American Steel Band Co., Pittsburgh, manufacturer of asphalt coated corrugated sheeting has opened a new branch office at 3719 Marmon avenue, Baltimore.

□ □ □

Pittsburgh Steel Products Co. has moved its Tulsa, Okla., sales office from the Atlas Life building to 1405 Philtower building. S. E. Elder is district manager.

□ □ □

Welders Supply Co., Tulsa, Okla., has taken over the Mid-Continent sales representation for Stoody Products Co., Whittier, Calif., following the closing of the latter's Tulsa office.

□ □ □

Starkweather & Broadhurst Inc., 79 Milk street, Boston, has been appointed sales representative in New England for boilers and turbines built by the Murray Iron Works Co., Burlington, Iowa.

□ □ □

Alco Valve Co., St. Louis, has moved from 5811 Manchester avenue to 2628 Big Bend boulevard, where it recently completed a plant containing 6300 square feet of space. John L. Schrode is president.

□ □ □

Niles Steel Products Co., Niles, O., has ordered equipment for its container division which enables the company to manufacture a complete line of metal containers up to 60 gallons in capacity.

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Aluminum Co. of America, Pittsburgh, has opened a southwestern district sales office at 1615 Allen building, Dallas, Tex., in charge of Edward B. Wilber, formerly of the Tulsa office, which has been closed.

□ □ □

North East Appliance Corp. and Delco-Light Co., both units of the General Motors Corp., Detroit, have been consolidated and will be known as the Delco Appliance Corp. E. A. Halbleib is president.

□ □ □

Climax Locomotive Works Plant at Corry, Pa., has been bought by Murray R. Olds, who plans to resume operations, producing a metal specialty, although no official announcement has been made. The plant has been idle for some time.

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Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has taken an order from the Pacific Gas & Electric Co., San Francisco, for equipment costing about $250,000. It includes four 25,000-kilovolt-ampere self-cooled air-blast transformers.

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William Kennedy & Sons Ltd., steel and iron founders, Owen Sound, Ont., will shortly establish a branch plant at North Bay for the manufacture of steel grinding balls for the mining industry. Old steel rails will be used.

□ □ □

E. D. Giberson & Co. has established general offices at the company's warehouse, Bush Terminal, Brooklyn, N. Y., but will continue to maintain its sales headquarters at 40 Rector street, New York, where E. D. Giberson, president, will continue to be located.

□ □ □

Southwark Foundry & Machine Co., Philadelphia, has become affiliated with the Baldwin-Southwark Corp. as the Baldwin Foundry & Machine Co. division, and its operations have been transferred to a new plant at Eddystone, Pa. The company manufactures hydraulic machinery, power tools, testing equipment and special machinery.

□ □ □

Hayton Pump & Blower Co., Appleton, Wis., has been acquired by the Black-Clawson Co., Hamilton, O., and the Appleton works will be transferred to Hamilton within 60 days, it is announced. The Hayton company was established about 10 years ago to manufacture centrifugal pumps, paper mill equipment and similar devices. M. D. Smiley is president.

□ □ □

Wean Engineering Co. Inc., Warren, O., has been licensed under a group of patents covering continuous pack and pair heating furnaces of the radiant gap type, mechanical feeding and catching equipment for two-high sheet and tin mills and Geeseman hot mill polishers, as well as under the patent combining the use of the continuous furnace with mechanical tables on a two-high mill. This method of producing sheets is termed the combination system.

□ □ □

Merritt-Chapman & Scott Corp., New York, William H. Baker president, ship salvor, marine and general contractor, is inaugurating a continent-wide construction service prepared to handle projects of magnitude anywhere in the western hemisphere. This service is made possible by formation of two subsidiaries, the Merritt-Chapman & Williams Corp., affiliated with W. Horace Williams Co., New Orleans, and Merritt-Chapman & Whitney Corp., affiliated with the Whitney Brothers Corp., Duluth and Detroit. Both these companies are long established and of experience in marine and construction work. William H. Baker is chairman of the board of both companies, which will operate as wholly self-contained units under direction of present officers of the New Orleans and Duluth companies. No financing is to be done at present in the consolidation of the companies' interests.

MIRRORS of MOTORDOM

DETROIT

AUTOMOBILE production has expanded each week since the turn of the year. One by one, important producers' plants have come back into activity, the movement being concluded by the resumption of Ford last week in all departments.

But the course of auto output has yet to develop a trend; the full effect of the shows is not yet felt. The moderate upswings in output since the first of the year have not been met by a commensurately rising curve in consumption. A genuine retail market has not been opened up.

Production, with but one or two exceptions, is largely for replenishing lowered dealer stocks. It will probably be February before the real receptiveness of the consuming public is felt.

In the meantime, General Motors' Chevrolet, Oakland, Pontiac, Buick, and more recently Ford's Model A, come off assembly lines in good number. Chevrolet's sales supremacy thus far in 1931 seems unquestioned.

Reversing a thought current some months ago, there is a growing belief that the auto industry will prove the cause, rather than the effect, that will lead business back to healthier levels. Reduced prices and attractiveness of new models are appraised as an irresistible lure.

First-quarter auto output however, will be under the corresponding period of 1930.

Same Model A—Yet

After suspending steel releases shortly after the first of the year, Ford resumed in full Jan. 12 and has begun to re-release material, though nothing much in quantity. Model A comes off the line the first three days of the week, with no major changes from the car produced up to the Dec. 18 shutdown.

For February, Ford has 12 working days lined up and 75,000 cars tentatively scheduled.

The steelworks and finishing mills, while scheduled to reopen with the rest of manufacturing activities Jan. 12, still are closed.

Outside body, windshield and wheel makers, to mention a few of Ford's representative parts' suppliers, are not getting good releases on their products, which points to large quantities of finished stocks at the Ford plant, for the 4-cylinder A is being produced at rates varying from 5500 to 7000 daily.

Chevrolet Output Moving

Steel releases from Chevrolet are good and fresh ordering is increased. Dealer stocks of cars are not bulging.

Though Chevrolet was producing in the closing months of 1930 substantially as many cars as today, only 19,000 cars were in dealers hands at the turn of the year.

Current output is close to 3000 daily, 5 days a week. January production, revised, will be close to 71,000 units. February tentatively is scheduled at slightly in excess of January, or almost 72,000 units.

◆

Hudson-Essex has practically stocked its dealers with the new 1931 line, and with retail sales yet to develop strongly, has curtailed production. This is the first instance of a reduction in operations following introduction of new models. Hudson-Essex has scheduled 3000 to 4000 models this month.

In the Chrysler lines a slight improvement is noted in releases of steel. Production is at 100 units daily, 5 days, and is stimulated by the sales reception at the recent New York show given to its higher-priced eights.

DeSoto, with refinements made in the new model, operates 5 days, but on a highly irregular daily basis.

Dodge is also at 5 days, but with the best day rate 300 daily. Probably one-sixth of this is trucks.

Hupp has resumed at both its Cleveland and Detroit plants.

◆

Buick is working 5 days weekly at 500 units a day. Of especial significance at this time is the fact that Buick will not announce new models in July, as has been its custom for some years past. Rather, it will be next January before changes are considered and the 1932 Buick is introduced.

Cadillac-LaSalle runs 5 days, 110 units a day. Of this output approximately 65 per cent is Cadillac. The entire division operates at 60 per cent of capacity.

Oakland-Pontiac makes 400 units a day, 5 days, of which Pontiac accounts for slightly over half. Pontiac alone has increased orders from Fisher for coupe bodies, for one model, 100 per cent in the current week.

Oldsmobile is at 100 units, 6 full days, with an eight still a possibility. The Viking, out of production, is being offered by dealers at half price, but discontinuance of the line is officially lacking.

Willys does 300 units daily, 5 days, but will make 8000 to 10,000 cars this month.

Auburn is at 50, 5 days, and Packard at 80, 5 days.

Ford Reduces Discounts

Ford has made some readjustment in dealers' discounts while shaving $5 to $45 off the base price of his current models. For some dealers, discounts will be smaller.

The reduction in retail prices of Model A Fords will be less, as a rule, than the reduction announced by Chevrolet when it brought out its 1931

models late last year, and thus the gap caused by the action of Chevrolet has not been entirely closed.

Scanning Ford history, it is noteworthy that most downward revisions of price have been made prior to a change in models, in order to move the old cars, or at a time when a sluggish retail market could be stimulated.

The rumor of the Ford eight is now in the state of being generally accepted, and attention centers on speculation of just when Ford will produce it on a large scale. Perhaps the best sign that the eight is to come is the absolute secrecy maintained at the engineering department and that, of the entire Ford organization, only three men can now sign passes to that division.

An X-type eight, reported favorite of Henry Ford personally, is being tested now in the far southwest. Whatever tool work in the form of die, jigs, fixtures, etc., manufacture is to be done for the manufacturing setup has not been received at the regular sources for that kind of production.

Ford may place this work upstate or in an adjacent district, two sites being specifically named, in order that secrecy be preserved.

General Motors Fortified

General Motors finds itself in a strong position, characterized by some as the best competitive situation it has enjoyed in all its history.

Chevrolet's bold front in beating the gun last October with 1931 cars has entrenched itself firmly and earned its supremacy, at present, in both sales and output in the low price field.

Oakland-Pontiac new models were received well at their recent inception, and production schedules are being boosted.

Buick is back at work. Cadillac-LaSalle is at 60 per cent of capacity. Oldsmobile works at a good clip on its new six.

For all divisions, General Motors feels thoroughly satisfied, closely watches automobile registration figures and produces on that basis. This is much in contrast to a year back, when its finished car stocks reached heights touched by none of the divisions as 1931 begins. Effort has been concentrated on better selling models and in the past year two slow selling General Motors products have been dropped.

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At least two new 16-cylinder models are coming this year to augment the Cadillac and Marmon lines already announced. One of these may be Auburn. There is some speculation that Packard will change to this type motor.

It is almost ten years since the Packard "twin-six" was discontinued and motor modes and construction have changed in that time. Packard's engineers have about determined on some revision.

◆

Economy among the motor manufacturers has assumed a new form. Standard blues and blacks in automobile paint jobs are largely a reflection of the tendency to cut on costs and special jobs wherever possible.

High efficiency is creeping into the production lines. While not involving a sacrifice to quality, mass production of standard colors is necessarily cheaper.

Trend to darker colors, too, may go hand in hand with the growing use of corrosion-resistant steel and chrome plating. Bright, silvery tones are best offset and made more effective against a dark body background.

◆

Free wheeling will have wider application before 1931 ends. This device, embracing fundamentally little more than an over-running clutch requires only slightly more steel than the orthodox gear shift and clutch.

Borg-Warner and Studebaker have pooled patents on this device and are understood to be making effort to offer its use to other motor car makers at a nominal sum in an effort to make the feature universal.

In competition is synchro-mesh transmission, also striving for general application. When Cadillac-LaSalle first developed the feature it is understood the cost ran to $50 and more per model, but that now the cost is an approximate one-tenth that figure and hopes are that before long it will find use on the lower price cars.

Another important producer will adopt synchro-mesh soon.

Great Lakes Adds Furnace

Great Lakes Steel Corp., after pouring continuously since last Aug. 23 from two of its new battery of six open hearths, is making bottom now on a third and fourth and at the same time takes off one of those which has been in active service for the past five months. . . . . If all manner of steel company merger rumors locally were accepted, talk would have it that Bethlehem was buying out every possible steel producer except the United States Steel Corp. . . . A new use for wire may be found if newly devised windshields with heated wire through the glass are adopted. Warmth keeps rain and snow from freezing on the glass's surface. . . . Budd Wheel will make a welded corrosion-resistant artillery-type wheel, which has short spokes and a large hub, for the Pierce-Arrow models.

Financial News of Steel Industry

BETHLEHEM Steel Co., Bethlehem, Pa., holds annual directors meeting Jan. 29 at which time annual statement for 1930 is disclosed.

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Michigan Steel Corp., Detroit, stockholders approved dissolution of the company on Jan. 15.

□ □ □

American Machine & Foundry Co., Brooklyn, N. Y., has declared regular quarterly of 35 cents a share, payable Feb. 2 to record Jan. 22.

□ □ □

National Steel Corp., Pittsburgh, earned net profit of $7,353,579 for nine months ended Sept. 30, after all charges.

□ □ □

James B. Clow & Sons Inc., Chicago, has called entire maturities of first and collateral trust A 5½ per cent bonds due 1932, for redemption Feb. 1 at 100¼.

□ □ □

Woodward Iron Co., Woodward, Ala., will receive until Jan. 29 tenders of sufficient bonds to absorb money now available in the sinking fund account from holders of first and consolidated mortgage 5 per cent bonds of the company.

□ □ □

Oliver Farm Equipment Co., Chicago, stockholders have approved plan for reclassification of convertible, preferred and common stock into one class of new common stock. Plan, upon completion, will make Oliver company have outstanding 200,000 shares of $6 prior preferred stock and 622,976 shares of common.

Fort Worth Sees Steel Plant as Possibility

Directors of the chamber of commerce of Fort Worth, Tex., are considering plans for financing a steel plant, estimated to cost $3,000,000, which St. Louis and New York interests are reported to be planning for Fort Worth.

It is reported that Harry Scullin, St. Louis, president of the Scullin Steel Co., will be president. The investment house of G. H. Walker & Co., St. Louis, and the engineering firm of McGrossin-Knapp, of New York, are reported to be interested in the proposal.

EDITORIAL

Building Lead in Steel Use Rewards 10-Year Growth

ENTHRONEMENT of the building industry as the principal consumer of finished rolled steel in 1930 came as something of a surprise to many who had believed that the rivalry for leadership was confined to the railroads and the automobile industry. However the record of the 10 years for which STEEL's figures of steel distribution are available shows that the building industry really merited a higher rating than that of a dark horse in the 1930 race. In fact, its showing for the decade is better than that of the automobile industry.

The percentages of the total tonnage of finished rolled steel consumed are as follows:

	Railroads	Building Industry	Automobile Industry
1921	(1)17.13	(2)14.23	(3) 9.82
1922	(1)24.96	(2)11.83	(3) 8.93
1923	(1)31.02	(2)13.53	(3)10.59
1924	(1)27.54	(2)14.44	(3)11.37
1925	(1)22.26	(2)15.26	(3)14.60
1926	(1)22.81	(3)13.10	(2)15.09
1927	(1)20.37	(2)14.89	(3)13.34
1928	(2)17.02	(3)15.22	(1)17.76
1929	(1)18.44	(3)14.70	(2)17.57
1930	(2)16.95	(1)17.80	(3)14.10

Figures in parentheses indicate rank of consuming groups.

According to this tabulation the railroads lead with eight first and two second rankings; the building industry follows with one first, six second and three third places; and the automobile industry is last with one first, two second and seven third ratings to its credit. Taking the decade as a whole the railroads lead by a large margin, buildings are a poor second and automobiles a good third.

Auto and Building Industries Whittle Down Railroad Supremacy

However the railroads' lead has narrowed gradually throughout the 10-year period. The trend of railroad consumption has been downward, while that of the automobile and building industries has been upward. At the present time, it appears likely that these tendencies will continue, and therefore the question as to whether automobiles or buildings will gain ascendency as the premier consumer becomes pertinent.

Past records show that in a good automobile year, the tonnage of steel taken by the motor car industry is sufficient to place that consumer in first or second place. The volume of steel per car each type has been mounting, but this has been offset by the increasing proportion of small cars to large cars.

On the other hand, the building industry now furnishes evidence that more steel will be required in the future than in the past. The volume of building construction in 1930 was not impressive. The average monthly building awards in eastern states in 1930 as compiled by the F. W. Dodge Corp. were only 61 per cent of the monthly average for the previous five years. But in spite of this comparatively low volume, the consumption of steel was higher proportionately than in previous years.

The finished rolled steel products which figure most prominently in building construction are structural shapes, plates, sheets, concrete bars, bars and small shapes, wire products and pipe and tubing—named in order of the tonnage consumed. Present tendencies in architecture and in methods of construction favor the more extensive use of practically every one of these forms of steel.

Many Structural Outlets for Steel Have Barely Been Scratched

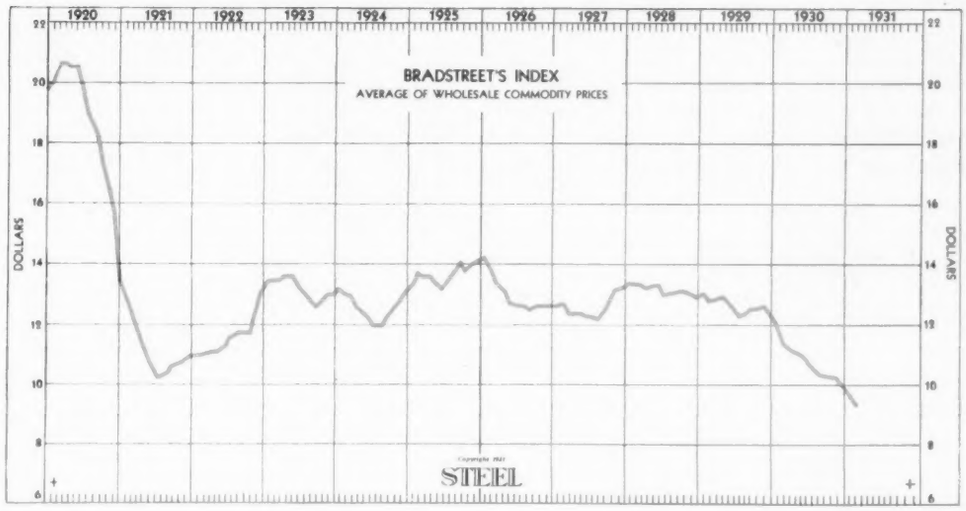
For instance, the consumption of structural shapes is being increased by virtue of the present vogue for monumental towers, such as the Chrysler and Empire State buildings, and also by the growing favor with which steel frame houses are being received by the public. The tall buildings have been proved sound in an economic sense and are so thoroughly emblematic of modern American architecture that they are an established institution. As for steel frame houses, it may be safely said the field has scarcely been scratched. Thus far steel frames have been developed largely only for residences costing $12,000 or more.

The battledeck floor construction, in which steel plates are welded to the frame for floors, is comparatively new, yet from Oct. 1, 1929, to Oct. 1, 1930, more than 30,000 tons of plates were utilized for this purpose.

Air conditioning is demanded in many buildings of modern construction. This provides a new consuming field for sheets. Steel frames for windows are gaining favor. One manufacturer of steel sash for office buildings used 28,000 tons of steel for this purpose alone last year.

These and many other developments in building construction show the possibilities for increased steel consumption and indicate that in the present decade the building industry will be a strong contender for first place among customers of the steel industry.

THE BUSINESS TREND



1930	
Jan. 1	$11.68
1929	
Dec. 1	$12.23
Nov. 1	12.40
Oct. 1	13.70
Sept. 1	12.67

1931	
Jan. 1	$9.51
1930	
Dec. 1	$9.84
Nov. 1	10.06
Oct. 1	10.30
Sept. 1	10.43

Business Moving Upward, Is Proceeding Cautiously

INDUSTRIAL activity continues its upward swing from the low point of the holiday season. The sound of the accelerated machinery of production is music to the ears of business, but sentiment this time will not be swept off its feet by encouraging news as it was early last fall.

In many respects the present situation is not unlike that of September, 1930. The period of holiday inactivity, extending from mid-December into the first week of January, was a brief counterpart of the mid-summer lull in July and August. In August, business men said, "Wait until September or October, when seasonal demand will stimulate industrial production." In the latter part of December they said, "Wait until January and February, when demand will cause an upturn in activity."

But while September did witness a moderate expansion, it was short-lived. After a few weeks of gradual recovery, the tide turned suddenly and almost overnight the slender gains had been wiped out and another period of drastic recession was upon us.

Wait for Signs That Expansion Exceeds Seasonal Trend

Remembering that painful experience, business men now are watching the present mild improvement more critically. Expansion must go beyond the limits of normal seasonal gains before they will become excited. In fact, complete confidence will not be restored until it is definitely established that real demand has appeared in good volume and that prices have been stabilized.

Thus far in January the record of these two factors, while encouraging, is not convincing. Manufacturers are testing their markets. The automobile industry is watching the shows with critical eyes, hoping to gauge the public's reaction to the improvements in motor cars and to prices, which afford more per dollar than was ever offered by the automobile industry. Automobile production last week was more than twice that of the preceding week, due to the resumption of the Ford operations, and to marked gains in several units of General Motors and to lesser increases in the schedules of almost all of the manufacturers.

Outlook for Activity in Building and Transportation Still Uncertain

At the moment the building situation is not encouraging. The expected revival in residential construction has not yet appeared and the volume of industrial and public work is not impressive. Authorities in the building field seem to be agreed that construction during the first half of 1931 will not equal that of the first six months of 1930. In the meantime, however, the weekly awards of structural shapes constitute one of the most active oulets for finished steel, indicating that even at low ebb, engineering construction affords a steady tonnage for the mills.

Recent purchases by the railroads account for the bulk of current rail requirements. Orders for steel for cars and locomotives in 1931 are not likely to show marked increases over normal, although they may exceed the low volume of 1930. Motive power and rolling stock on the leading railroads are in good condition and volume of freight and earnings do not pre-

sent a strong urge for much additional equipment at present.

The oil and gas industry continues in the market for pipe and other products but the long-time trend of this consumption is somewhat clouded by the present struggle for adjustment of petroleum output and by the political turmoil which surrounds the activity of public utilities.

Commodity Prices Still Tend Downward, But STEEL'S Composite Is Up

Uncertainty as to the future activity of these four important branches of industry makes it impossible to predict the extent of their contributions to general business recovery in the next few months. Thus far requirements of these and other consumers have been responsible for increasing the rate of steel ingot production to within a few points of 50 per cent. The rate has been below 50 per cent since the week of Oct. 19, when it was 52 per cent.

Commodity prices continue to puzzle business. The chart at the beginning of this discussion shows how sharply prices dropped during the closing months of 1930. Many of the wholesale price barometers have dropped several points in each of the first two weeks of January. One exception to the general decline is STEEL's composite of steel and iron prices which last week stood at $31.73 after remaining at $31.66 for several weeks. The gain of 7 cents is the first upward turn in the composite since last June, when for one week a slight increase was recorded. Prices have declined steadily, with only a few inconsequential interruptions, since May 22, 1929, when a peak of $37.13 was registered.

It is still too early to say that the present decline of iron and steel prices is at its end. At this writing it seems likely that STEEL's composite for Jan. 21 will remain at $31.73 or perhaps register a further slight gain. But whether the long downward trend has been halted definitely or whether the present upturn is merely a temporary interruption cannot be determined until finished steel prices are tested more thoroughly.

Security prices have improved somewhat in the past few weeks, but the movement still is irregular and trading on the New York stock exchange has been at a moderate rate.

Money rates continue easy, with acceptances slightly lower than at the turn of the year.

Composite of Iron and Steel Prices Turns Upward

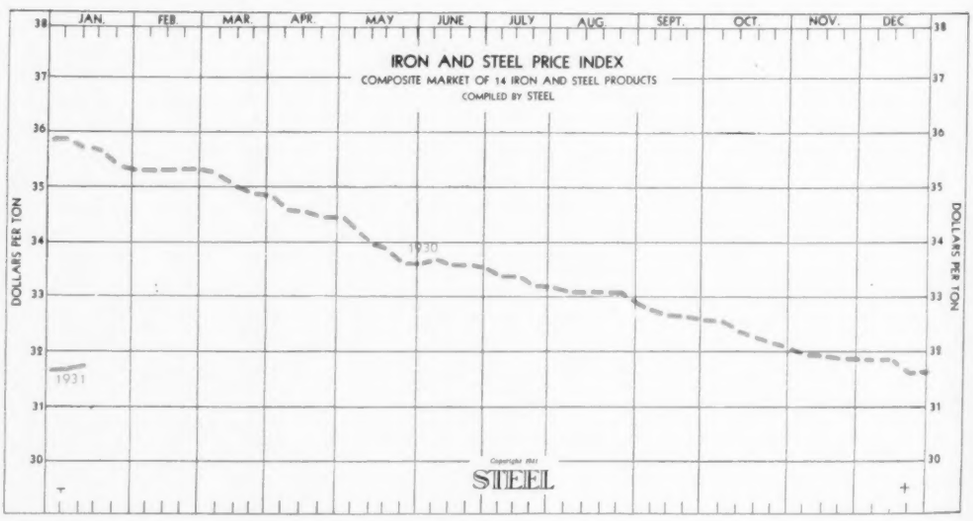
STEEL's composite of 14 iron and steel prices, after remaining at $31.66 for three weeks, turned upward and on Jan. 14 stood at $31.73. This is the first gain since June 4, 1930. A year ago the composite stood at $35.60. The gain was due to the fact that reinforcing bars were advanced $1 and bars and plates approached a single asking price of 1.65c, Pittsburgh. Prices have declined steadily since May 20, 1929, and the period of decline—now of 20 months' duration—is unusually long. The price slump of 1921 and 1922 continued for only 17 months.

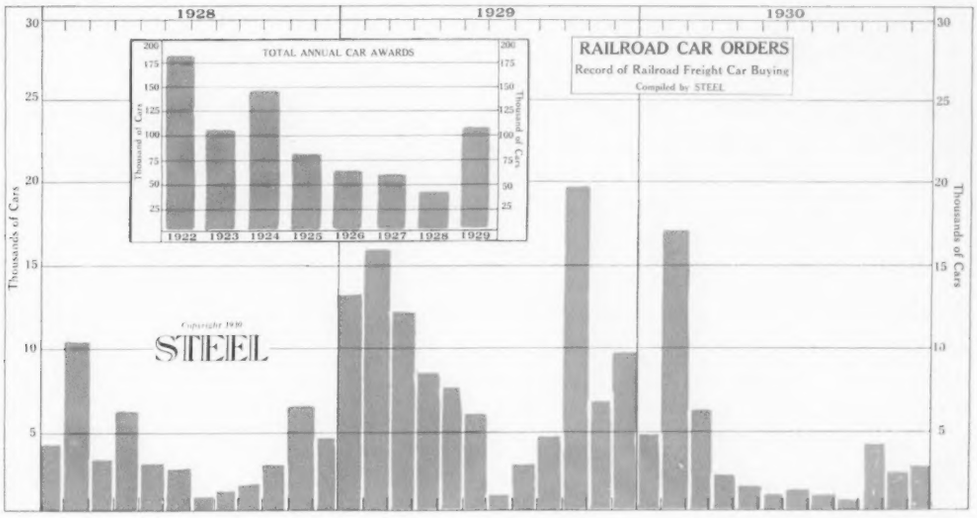
Weekly Figures

Jan. 14, 1931	$31.73
Jan. 7	31.66
Dec. 31, 1930	31.66
Dec. 24	31.66
Dec. 17	31.68
Dec. 10	31.84
Dec. 3	31.84
Nov. 26	31.86

Monthly Averages

December	$31.74
November	31.92
October	32.26
September	32.65





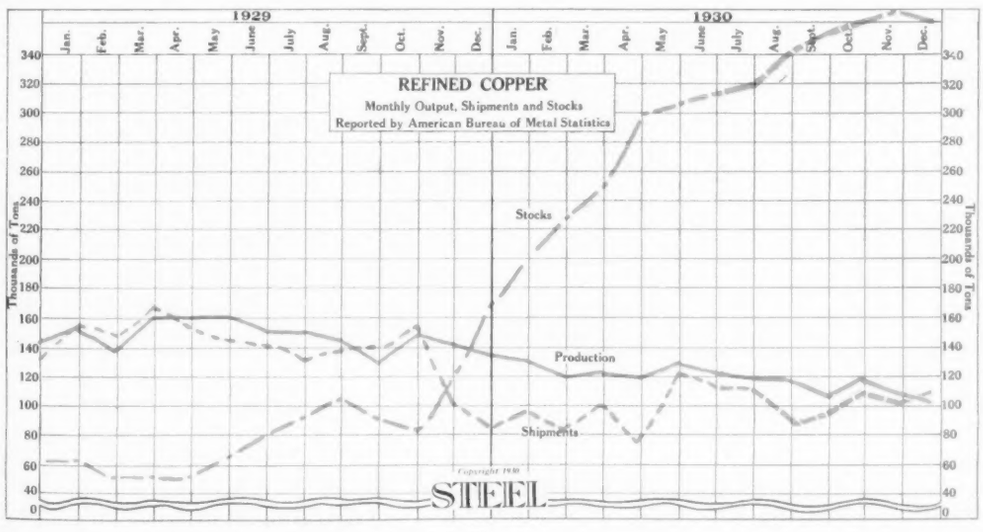
	1930	1929
December	2,729	9,710
November	2,621	6,361
October	4,116	19,506
September	576	4,517
August	1,111	2,854
July	1,389	341
June	998	5,886
May	1,392	7,562

December Freight Car Orders Make Slight Gain

With a slight gain over the November figures, December orders of domestic freight cars were responsible for lifting the aggregate for 1930 to a total just above that of 1928, although it is less than half that of 1929. Two thousand, seven hundred and twenty-nine cars were ordered in December, as compared with the revised total of 2621 cars for November. In the year 1930 45,146 cars were awarded. Purchases in 1929 were 106,105 cars, in 1928 were 44,763, and in 1927 were 63,295. February, usually a good month, was also the best for 1930, with 17,027 cars being placed. The comparatively poor showing of 1930 was marked by an accentuation of the midyear slack period.

Stocks of Refined Copper Break After 15-Month Steady Climb

Continuation of the decrease in production combined with a slight increase in shipments in December brought an end to the steady increase in stocks of refined copper. Although stocks of 367,175 tons were but little under the 369,832 tons of the preceding month, the decline was the first since October, 1929, at the end of which time there were 88,401 tons on hand. Rising above production for the first time since the same month, shipments in December gained 1279 tons and reached 109,023 tons. Production in December amounted to 106,366 tons as compared with 112,646 tons in November. A total of 1,459,370 tons were produced and 1,263,515 tons were shipped in 1930.



Stocks

December, 1930	367,175
November, 1930	369,832
December, 1929	171,320

Production

December, 1930	106,366
November, 1930	112,646
December, 1929	138,203

Shipments

December, 1930	109,023
November, 1930	107,744
December, 1929	93,802

STRUCTURAL STEEL CREATED THE SKYSCRAPER

STEEL SOON BEARS RIPE PROFITS

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THE "cloud-touchers" are steel! Every one knows that now. Knows, too, that the higher spires and more daring spans to come must be steel. Of greater significance is a growing recognition of this fact: The humble building at a skyscraper's base, or the modest bridge astride a rural stream, is ready sooner, serves better and lasts longer when this matchless metal is used.

For steel brings the same speed and economy in construction, the same predetermined strength and security to homes, schools, and small as well as large apartment and mercantile houses, factories and bridges. It comes to a building site ready to go into place. Heat or cold, rain or snow cannot affect it. It is permanent, fire-resistive, cannot shrink. It may be quickly erected wherever and whenever men can work.

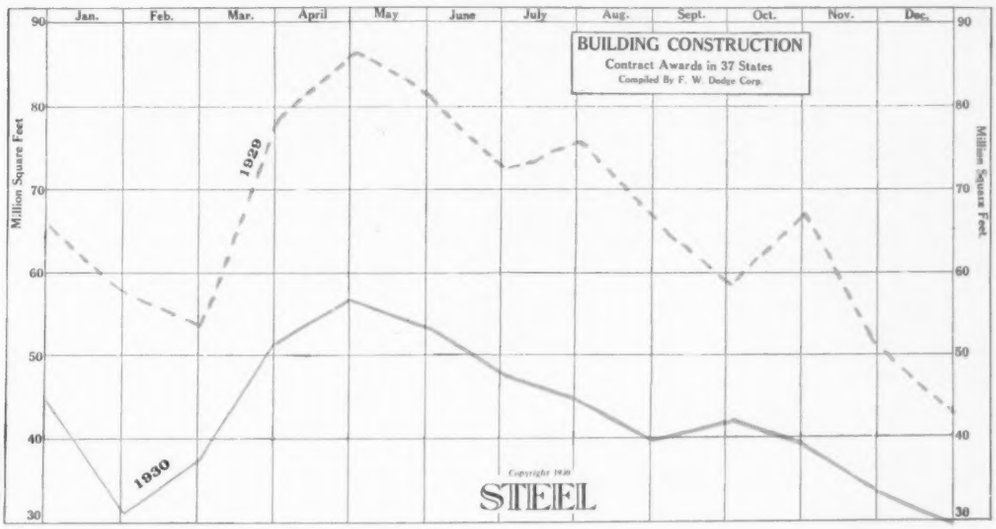
Before building anything, find out what steel can do for you. The Institute serves as a clearing house for technical and economic information on steel construction, and offers full and free co-operation in the use of such data to architects, engineers and all others interested.

"MUNICIPAL CENTER FOR CITY OF MEDIUM SIZE." AN ENLARGEMENT OF THIS DESIGN BY HUGH FERRISS, ON SPECIAL STOCK FOR FRAMING, WILL BE MAILED WITHOUT CHARGE TO ANY ARCHITECT, ENGINEER OR BUSINESS EXECUTIVE.

The co-operative non-profit service organization of the structural steel industry of North America. Through its extensive test and research program, the Institute aims to establish the full facts regarding steel in relation to every type of construction. The Institute's many publications, covering every phase of steel construction, are available on request. Please address all inquiries to 200 Madison Avenue, New York City.—In Canada, to 710 Bank of Hamilton Bldg., Toronto, Ontario. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas, San Francisco and Toronto.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

STEEL INSURES STRENGTH AND SECURITY


BUILDING CONSTRUCTION
Contract Awards in 37 States
Compiled By F. W. Dodge Corp.
Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.
90 80 70 60 50 40 30
Million Square Feet
1929
1930
Copyright 1930
STEEL

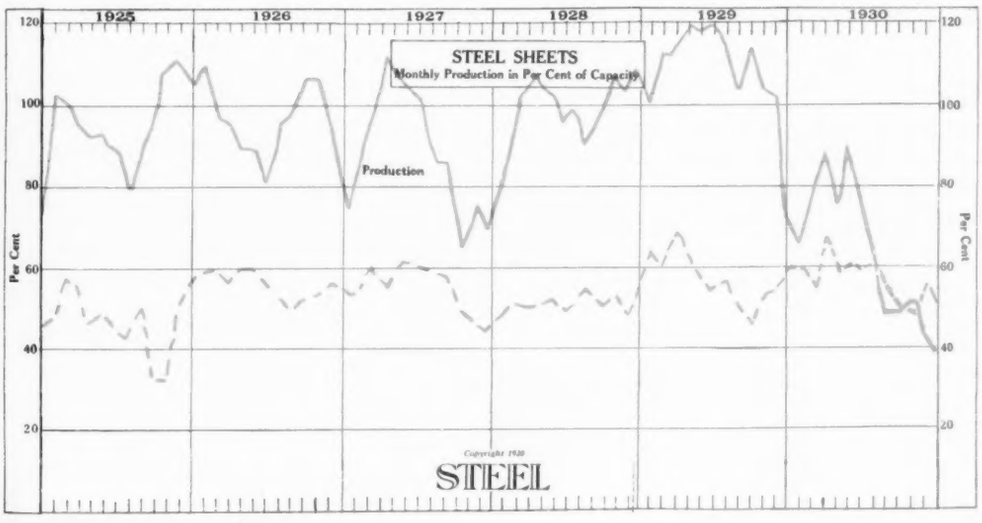
Square Feet	
December, 1930	29,054,600
November, 1930	33,098,600
December, 1929	44,010,000

Building Construction Slumps in December as Residential Awards Dwindle

December construction awards in 37 eastern states, as reported by the F. W. Dodge Corp., dropped again, and amounted to only 29,054,600 square feet. Of this amount residential construction accounted for 14,704,900 square feet and industrial construction for 2,162,800 square feet. In the previous month the ratio had been 18,844,200 to 2,141,900. In December, 1929, awards totaled 44,010,000 square feet, after a sharp drop from 65,610,000 in October of that year. Until December, the lowest month for 1930 had been January, with 32,920,000 square feet of building awards. During the middle part of the year residential building bolstered the totals, but fell off rapidly in the final quarter.

December Output of Steel Sheets Down, But Sales Gain Appreciably

Both output and stocks of steel sheets decreased in December, according to statistics compiled by the National Association of Flat Rolled Steel Manufacturers, and at the same time shipments dropped. Production, which in November had been at the lowest rate for several years at 43.6 per cent of capacity, fell in December to 39.8 per cent. Stocks in December were 50.6 per cent of capacity, after turning upward in November to 54.1 per cent. December shipments fell to 39.5 per cent and orders rose to 103.8 per cent, a substantial gain. The principal movement took place in sales, which jumped from 39.8 per cent in the previous month to 63.9 per cent in December.

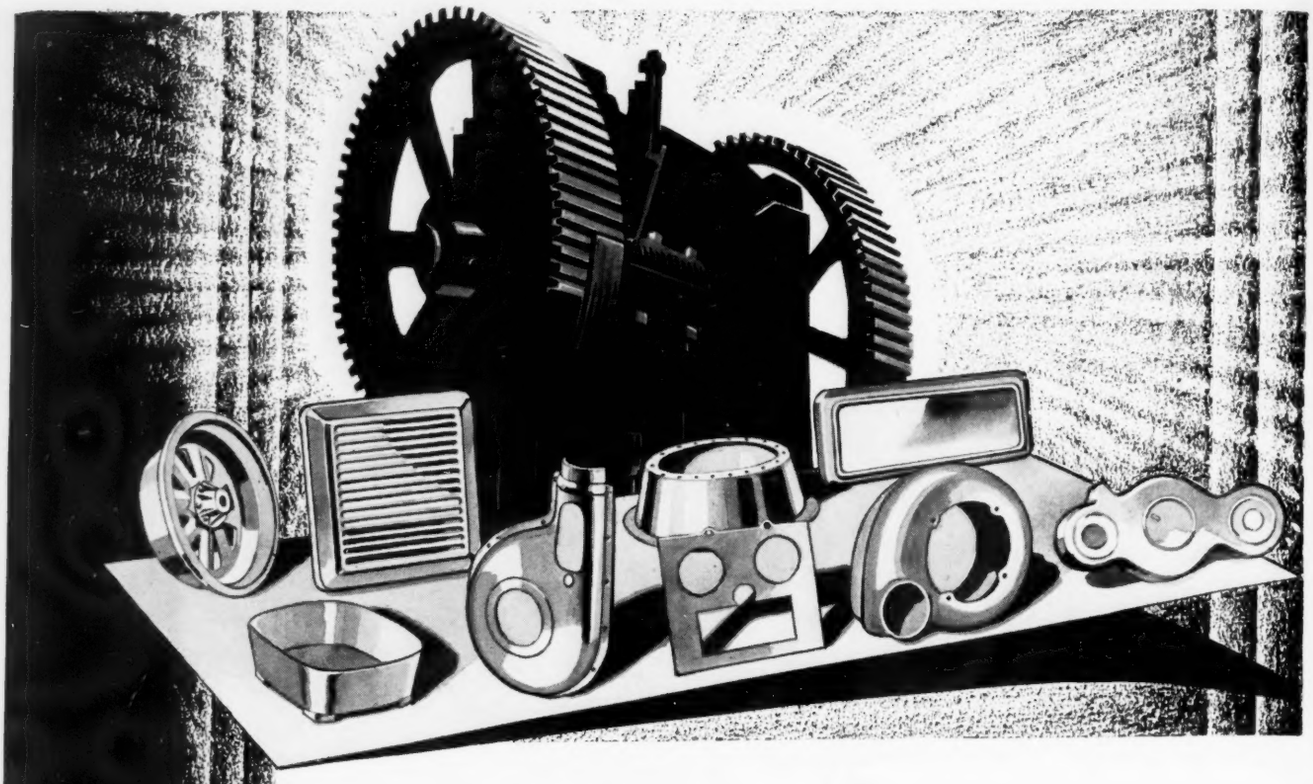


Production
Per cent of capacity

	1930	1929
December	39.8	60.0
November	43.6	65.8
October	50.6	95.3
September	48.8	97.7
August	48.6	109.7

Stocks
Per cent of capacity

	1930	1929
December	50.6	57.3
November	54.1	57.6
October	49.4	50.5
September	50.4	50.1
August	50.9	42.9



Flat Rolled Steel and Powerful Presses . . . . have saved many concerns

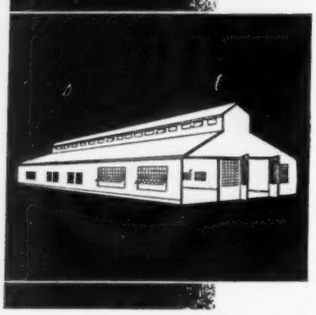
THE advent of the pressed steel engineer has meant the innovation of new manufacturing methods, big reductions in material, production and handling costs — stronger, lighter, better looking products for many companies.

His duties are to study your products, discover if they need and lend themselves to redesign and, if so, make recommendations that will enable you to enjoy the savings and profits made possible by adopting pressed steel.

Pressed steel is cutting production and shipping costs for your competitors — or will in the near future. Study your own products. Call in the pressed steel engineer and ask him — "Can this be made of pressed steel?" Though not an accountant, he can often turn red figures into black.

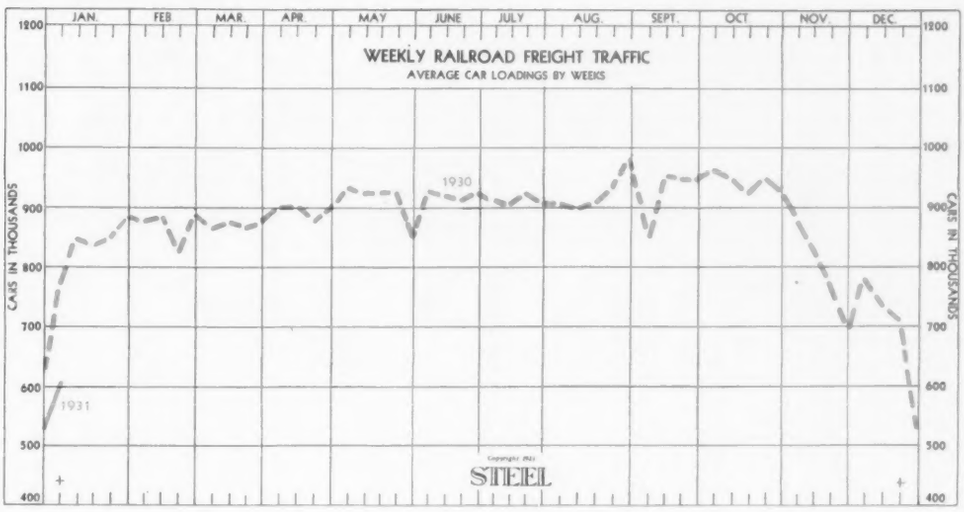
We shall be glad to put you in touch with men who can give you an accurate estimate of the advantages which you can obtain with pressed steel. If it won't pay you to change they will tell you so frankly.

And while you are thinking of steel — consider the many advantages of steel buildings — saving time, money and supplying more usable space — steel office furniture — saving depreciation and fire loss — steel partitions (toilet and office) which permit speedy erection, easy removal, and provide durability and a decided saving in upkeep. For information just write Trade Research Division, National Association of Flat Rolled Steel Manufacturers, Terminal Tower Building, Cleveland, Ohio.



Steel buildings save money, erection time, upkeep—and provide more usable space.

Save Money Labor Time with Pressed Steel



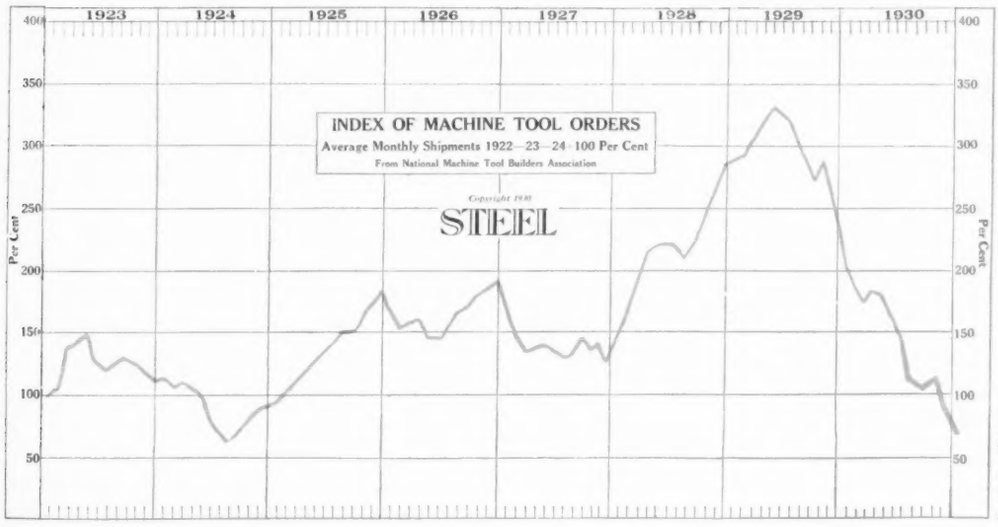
1931	
Jan. 3	615,382
1930	
Jan. 3	775,745
Dec. 27	538,419
Dec. 20	713,810
Dec. 13	744,443
1929	
Dec. 27	639,389
Dec. 20	842,775
Dec. 13	922,861

Freight Car Loadings Increase, But Rise Is Moderate

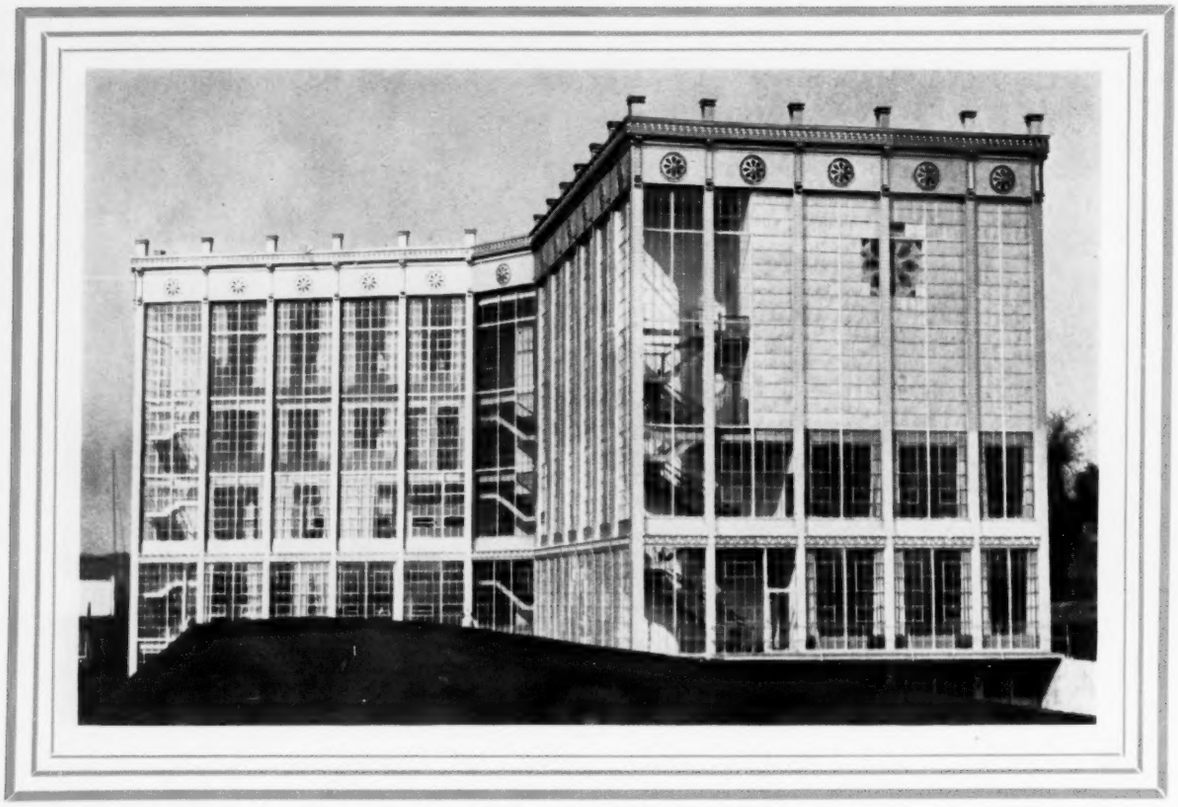
Not only did loadings of revenue freight meet with more than a seasonal reduction during the holiday week at the end of 1930, but they also failed to make more than an ordinary recovery at the beginning of 1931. For the week ended Jan. 3 a total of 615,382 cars were loaded, the gain being 76,963 over the previous week. However, the loadings were 160,363 cars or 20.6 below those of the corresponding week of 1930, and 183,300 or 22.9 per cent below the figures for the corresponding week of 1929. Reductions were not confined to certain districts, but were distributed throughout the country, and were felt in the handling of each of the various types of commodities.

December Machine Tool Orders Improve, Moving Average Again Drops

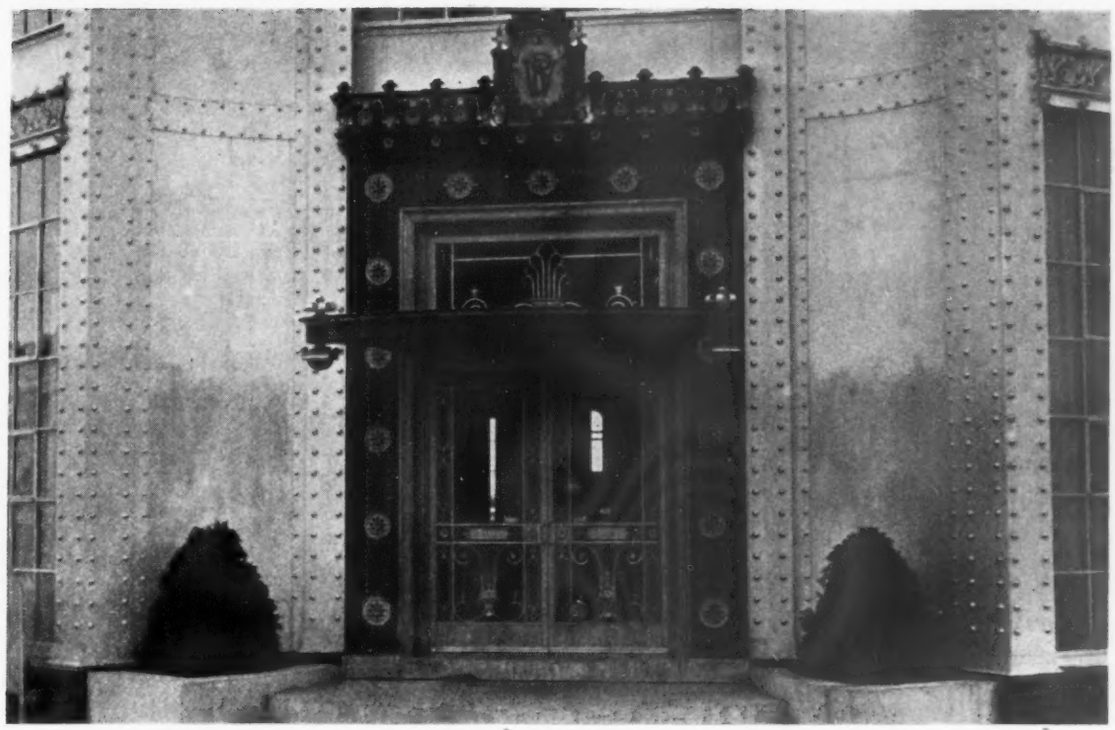
Machine tool orders in December ceased to decline, but the three months' moving average compiled by the National Machine Tool Builders' association slid further downward to 73.1, again the lowest point in more than six years. The index for the entire year of 1930 is placed at 127.8, as compared with 281 in 1929 and 236.6 in 1928. Shipments in 1930 ran ahead of orders throughout the year, but the shipment index was only 152.6 compared with 284.6 in 1929. Unfilled orders were heavy at the beginning of 1930, but at the end were down 64 per cent. January orders must increase about 30 per cent over December in order to turn the three months' moving average upward.



	1930	1929
December	73.1	222.1
November	95.5	247.2
October	113.3	287.0
September	113.6	265.8
August	110.2	286.1



RESPLENDENT in aluminum-bronze paint and penetrated throughout by sunlight, the new office building and museum of the Worcester Pressed Steel Co., entirely of steel and glass, suggests some futuristic architectural conception come to life. The view above shows the rear facade and one end of the structure, the covered portion in the upper right being one end of the armory and museum, glass having been replaced by steel plates to concentrate light on the large rose window, seen near the top of the enclosure.



Highly decorative entrance to the building with marquee of steel and wrought iron and numerous other intricate designs in wrought iron and art-forged steel. A strikingly rugged effect is obtained by the use of rivets with extra-large heads

Office Building of Steel and Glass

BY WILLIAM F. HOLLAND

Worcester Correspondent, STEEL

TWO hundred and fifty tons of steel, 35,000 panes of glass, and an idea are the ingredients which John W. Higgins, president of the Worcester Pressed Steel Co., Worcester, Mass., combined to build a monument to his enterprise and a tribute to his industry, at the same time revealing uses for steel in what may prove to be a new era in building construction.

Today the Worcester Pressed Steel Co. is occupying its new office building—a building of steel and glass—a workshop and a museum in which is told from its earliest days the progress of steel from the first crude tools of early man down to the completed chassis of the modern automobile, 90 per cent of which is pressed metal.

According to its engineers, the steel and glass structure possesses advantages of equal building costs, beauty of architecture, increased lighting facilities and durability equal to any utilitarian demand. The building is the first of its kind in the United States, although similar units are under construction in New York and Chicago.

Several years ago Mr. Higgins, vexed by losses and delays incident to dropped and lost tools in poorly-lighted plant buildings, cast about to find a type of building providing a maximum of daylight for the interior. One suspects, however, that further he sought to build a structure of advanced design which in addition to its value as a place in which to work might be at the same time a steel building for a steel man, a monument to the industry to which he has given his life, and to which his own products might contribute.

The new building of the Worcester Pressed Steel Co. answers all the requisites. Rising four stories high on a commanding knoll in front of the present shops its aluminum-bronze painted columns are magnets of attention and its warmth to the eye belies the often expressed fear that a building of steel and glass

Continuous sash sections accentuate the sweep of the 85-foot vertical steel columns. The crowning frieze of steel plates, each having the rose-window pattern in perforated metal, lends a distinctive touch

would present a drab appearance.

The structure comprises two wings each 100 feet long, meeting in an obtuse angle to conform to street lines. Vertical structural columns, 85 feet in height, which are the supporting members of the building, present a striking appearance to the exterior, the columns being studded with rivets with extra-large heads.

Intricate Designs in Metal

These vertical columns are 12-inch H-sections with a 13-inch plate attached to the outside. Between the columns are continuous sash sections secured by bolts on a channel section. A frieze of steel plates crowns the exterior, the plates being ornamented by intricate patterns in perforated metal and a flat metal crown mold in which the bands of cornice castings, emphasized by wrought iron scrolls at each joint of support, serve to exemplify the various methods of joining and working metals by rolling, casting, welding, stamping, punching, forming and forging.

The entrance, set in a recess at the confluence of the wings, carries out the steel idea with a marquee of steel and decorative wrought iron. Doors are of plate glass set in corrosion-resisting steel frames and covered with a protective grillwork of forged and polished steel. An inner vestibule door is of forged bronze and glass. The octagonal reception lobby has a battledeck steel floor with tile covering. An accompanying illustration shows how this floor of ¼-inch steel plate is mounted on 3-inch I-beams, the resultant effect being simple, clean cut and of unusually high strength.

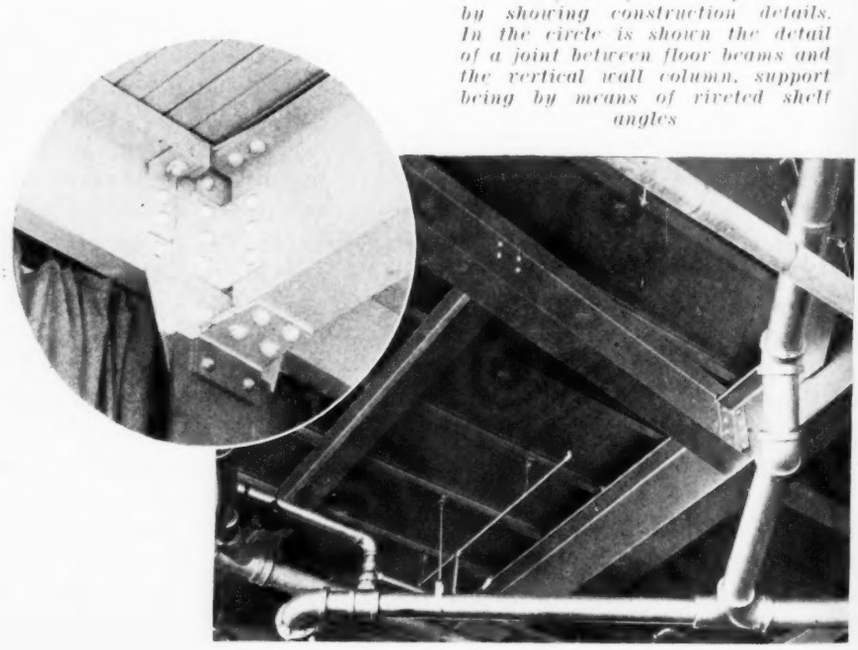
The first two floors are devoted to offices and reception rooms. The third floor and mezzanine is known as the John Woodman Higgins armory. Mr. Higgins for years has pursued actively the hobby of collecting examples of pressed metal. His collection of armor is considered without peer in any city among private collectors. He has assembled for exhibition examples of pressed metal covering a period of many centuries, including primitive metal tools, ornate hammered suits of mail for knights and their horses, numerous present day products of the Worcester Pressed Steel Co. and others.

A summary of the outstanding features of this armory might be appropriate. The third floor occupies two full stories of the building, permitting mezzanine galleries and high vaulted naves, each of the two wings presenting the appearance of a Gothic nave, 35 feet high to the groins. Along the side of each wing is a gallery or aisle and beneath each gallery is another aisle. The two naves are joined by a high octagonal vestibule. At the extreme end of each wing is a rose window, fashioned in typical fourteenth century style of deep-colored leaded glass.

Interior Effects Harmonize

Woodwork, including large heavy doors, although used sparingly is of striking appearance, all of old English gnarled oak with semipolished hand-forged hardware and trimmings in the Gothic motif. Walls and vaulted ceilings are of stone, tinted to harmonize with the medieval atmosphere. The east wing is devoted to medieval artcraft and contains pieces of the stone age, bronze age and iron age. Chiefly, however, the collection consists of products of smiths in the days when fighting in armor was the vogue. A succession of figures in full armor, mounted on armor-clad horses, visualizes advances made in the smith's art and the successive contributions of the Gothic, Maximilian and Renaissance eras.

Simplicity of design and construction is the keynote of the building. Floors are laid on cross beams supported by shelf angles. The roof is trussed and held in place by a steel plate which also supports the ornamental figures. The problem of expansion was considered by Harty & Brown, Boston, the engineers, when the building was in process of plan-



VIEW taken beneath the battledeck floor of the reception lobby showing construction details. In the circle is shown the detail of a joint between floor beams and the vertical wall column, support being by means of riveted shelf angles

ning; their decision was that the expansion and contraction on each sash section would be so small as to be negligible and construction went ahead without any particular allowances for expansion, except that each wing has some few expansion plates. This feature of steel and glass construction will be understood better after the building has weathered a year in the extremes of heat and cold in New England.

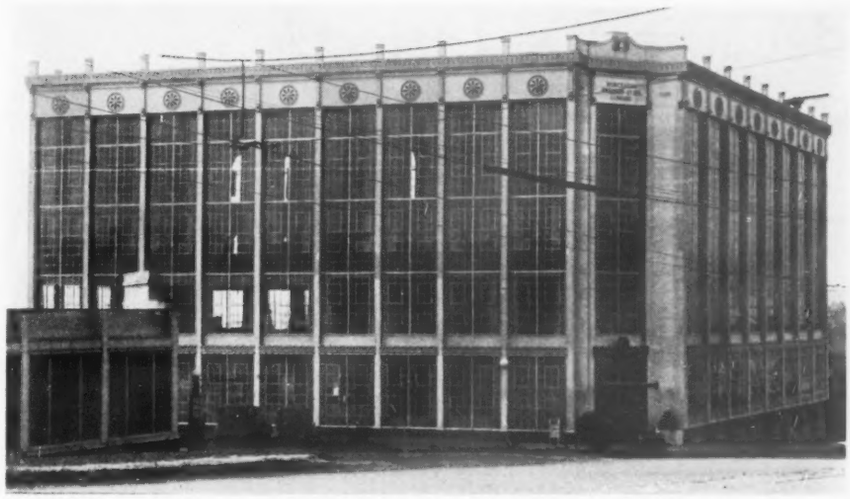
The primary objection that a building with so much glass surface could not be heated save at prohibitive expense in ordinary cold weather and not at all probably in the sharpest days of winter, was disproved with the erection of the experimental single-story garage, also of steel and glass. Tests by heating engineers proved that a building of steel and glass could be heated satisfactorily as inexpensively as could a poorly-built wooden mill building and at slightly greater cost than a well-constructed brick building.

Nor is the cost of construction above the price of brick construction. Practically, according to Mr. Higgins, they are the same. The new building of the Worcester Pressed Steel Co. cost approximately $300,000, one-third of which was for steel. Furthermore, steel and glass construction effectively solves the question of adequate daylight for the interior. No dark corners are to be found in this building of steel and glass, with adequate daylight admitted through 35,000 window panes and distributed evenly on floors, desk tops and benches.

Use of Electric Welding for Pipe Lines Increases

The greatest advance in the use of electric welded field joints for pipe line construction took place during the last five months of 1930 according to Welding Engineering Co., Bartlesville, Okla., which completed the welding of 452 miles of large diameter gas pipe from July 24 to the end of the year. In this mileage there were over 40,000 welds. Most of the pipe was 20 to 24-inch, but to date no welds have been reported cracked or broken, either during construction or while in use. The increased use of this method of fabrication has been attributed to the use of heavily coated rods and the development of the shielded arc.

The lines welded by the company are as follows: Cities Service Gas Co. line from Dilworth, Okla., to Wellington, Kan., 32 miles, 20-inch, solid welded; Missouri-Kansas Pipe Line Co. lateral lines in the Texas panhandle, 24 miles of 18 and 20-inch, welded and coupled; Continental Construction Corp., 306 miles in Texas, Oklahoma, Kansas and Iowa, 24-inch, welded and coupled; and United Gas Co., 90 miles between Refugio and Kenedy, and Converse and San Marcus, Texas, 12, 16 and 18-inch, welded and coupled. In addition to the above mileage completed in 1930, the company has uncompleted contracts for electric welding totaling 547 miles.



The single-story garage in the left foreground is of steel and glass and was built before the main building in the background was erected, tests on the garage confirming the adaptability of this type of construction

Cost of Gas Pipe Lines Is Surveyed in Booklet

All major factors that affect the total cost of gas pipe lines have been carefully studied and charted by the A. O. Smith Corp., Milwaukee, which presents the results of the study in an elaborate bulletin. The method used to determine the minimum cost of the pipe lines has been built up with care. All formulas are developed, and are reproduced in chart form in order that designers might have a convenient solution to their problems.

Included in the bulletin, designated as No. 510, is a comprehensive relation of the methods of pipe line welding employed by the Smith company, and a description of a number of actual situations encountered in the field and methods used to overcome them. A supplement presents engineering data on pipe manufactured by the company in both chart and table form.

Industrial Sash Provides Efficient Protection

Attacking the problem of securing maximum lighting with a minimum loss of heat, an improved industrial sash has been introduced which has been made weather-tight by means of a felt weather strip on all four sides of the ventilator. This sash, manufactured by Campbell Industrial Window Co. Inc., New York, is said to be the first and only improvement made in 20 years in the construction of industrial sash. Always popular, because of the window area provided, the former sash design has been criticized because of the leakage of wind, rain and snow, and the creation of a heating problem. The new design is said to successfully overcome these difficulties.

The weather-stripping is built into the sash at the factory as it is the only way it can be adjusted properly, and permanently held in place. The felt weatherstrip is held in a metal container that is spot-welded to the sash or frame as the case may be with the felt forming the inside weathering contact. The felt is placed on the inside to allow any condensation that may form to pass through the outside contact of metal to metal.

Plan Foundry Conferences

A series of conferences in the important industrial centers of the southern and southwestern territory is being planned by the Gray Iron institute to inform gray iron foundry executives of the activities underway in the various departments of the institute. The meetings, which in every case will start with a luncheon at noon, are scheduled as follows: Feb. 6, Statler hotel, St. Louis; Feb. 10, Muehlebach hotel, Kansas City, Mo.; Feb. 13, Huckins hotel, Oklahoma City; Feb. 16, Adolphus hotel, Dallas, Tex.; Feb. 18, Rice hotel, Houston, Tex.; Feb. 20, St. Charles hotel, New Orleans; Feb. 27, Tutwiler hotel, Birmingham, Ala.; March 2, Ansley hotel, Atlanta, Ga.; March 4, Read house, Chattanooga, Tenn.; March 6, Brown hotel, Louisville, Ky.

Because It's Tested, Millions Travel Safely

BY H. F. MOORE
University of Illinois

ORDINARILY we think of the days of prophets and soothsayers as past, but this is not so. True, styles in prophets have changed greatly since the days of the Witch of Endor and the Delphic Oracle. Phrophets of olden time, in performing their official duties, mumbled incantations, brewed magic messes, and made wise cracks about the arrangement and the significance of the intestines of freshly slain fowls. Prophets of today make predictions with the aid of the test tube, the microscope, the slide rule, and the testing machine.

A large group of modern prophets makes a business of predicting how steel, brass, aluminum, concrete, brick, wood, and rubber may be made to serve satisfactorily as materials for buildings, locomotives, automobiles, airplanes, sewers and bridges. As in the ancient world there were schools and fraternities of prophets, so in the modern world the prophets gather together into associations and societies, and the American prophets of the strength and durability of materials are gathered into the American Society for Testing Materials.

Many Materials Available

In the *Outline of History*, H. G. Wells recognizes one fact which most of the older historians have failed to see, namely that one important element in our modern civilized life is the fact that today we have available many *materials* whose strength can be predicted and controlled. Builders of the ancient world had to take materials as they found them in nature. Even the makers of the famous Damascus and Toledo blades were largely dependent on the occurrence in nature of fortunate combinations of ingredients in the ores near at hand. They used many a weird rule of thumb in tempering their steel, and kept no record of their failures.

When we think of the marvels of modern applied science we naturally think of dramatic marvels, the giant locomotive, the light but powerful airplane engine, the 125,000-horsepower dynamo, the sky scraper; but not one of these would have been possible unless there had been developed strong, durable, workable materials out of which to build them. We all cross bridges, walk under trolley wires, ride in automobiles, and our personal safety is dependent a score of times a day on the strength of the material.

Not only are we all vitally concerned with our physical safety, we are also greatly concerned with the *cost* of living, the cost of clothing, household goods, farm implements, with the amount of the taxes we must pay to keep up sewer systems, pavements, water works. Now a large factor in determining these costs is the wisdom used in selecting suitable materials, materials whose money cost, strength, and durability are well balanced.

What kinds of tests do these modern prophets of structural stability use in their ritual of prediction? Many kinds. Watch the operation of a big concrete mixer on a job of road building. Every once in a while a young chap comes along, takes a bucket or two of concrete from the sticky stream pouring out from the mixer, and pours this sample of concrete into molds in which the concrete hardens into cylinders about the size and shape of a large baking powder tin. Then, after perhaps a week, these hardened cylinders are tested to destruction, that is squeezed to bits in a huge press which is fitted with heavy platform scales to weigh the pressure applied. If the sample cylinders do not withstand a sufficiently high pressure the concrete job is condemned, and it must be torn up.

Sometimes material can be tested without destroying a sample of it. If you get a chance to examine the crankshaft of an automobile engine you will find somewhere on it what looks like a little dimple. That dimple is the test mark resulting from pressing a ⅜-inch steel ball against the shaft with a pressure of 6600 pounds. The harder and stronger the steel, the smaller the dimple. If in the factory a shaft comes to the inspector in which the test dimple is too large, that shaft goes back to be tempered over again.

Chemist Aids Quality

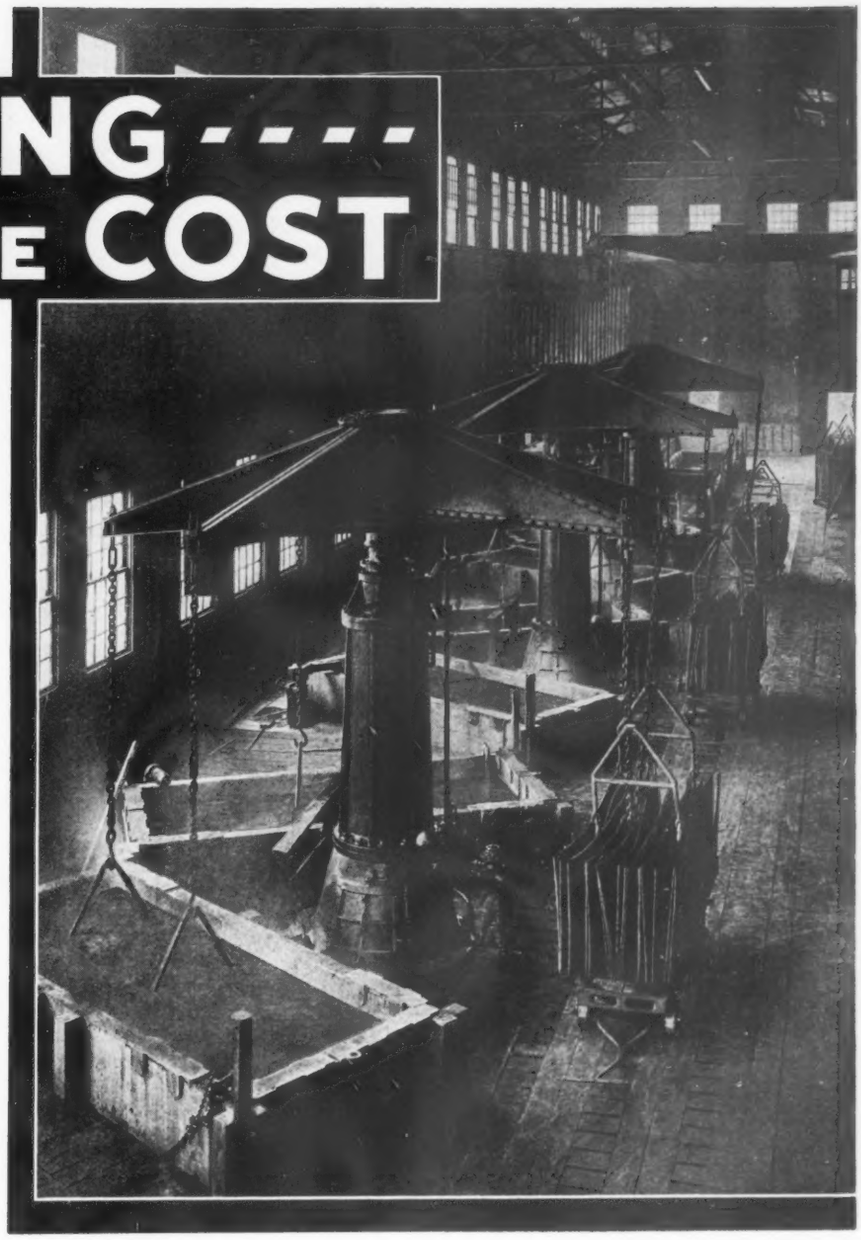
Of course, the chemist with his test tubes and balances and ability to tell what ingredients are present in any material, and how much of each, is one of the fraternity of materials prophets. If the chemist did not inform the rail mill when there is too much phosphorus in the steel they are rolling we would have many more railway accidents than we do, and if the chemist did not keep the rubber manufacturer posted on how much sulphur there is in the rubber we would have much more tire trouble on our week-end trips.

Prophets who use the microscope show just how metals are made up of little crystalline grains, and the newest of the schools of materials testers make the X-ray show up hidden flaws inside various materials. They also show the pattern arrangement of the very molecules in a solid, particles so small that it takes about 300 of them end to end to be visible to the most powerful microscope.

The development of the science of testing materials is a comparatively recent thing. Perhaps the first systematic testing of materials was done some two and a half centuries ago in connection with insuring a standard quality of coinage. That gigantic figure in the scientific world, Sir Isaac Newton, did not think it beneath his dignity to spend many of the best years of his life developing standards for metals and processes in the British mint. However, the idea of systematically testing the common materials of every-day use is quite recent. The troubles of the early railroads with axles and rails was a great factor in encouraging such testing. The Prussian state railways back about 1850, and our own railways in "the gay 90's" began to demand materials whose strength and ductility were not merely glibly

THE prophet speaks! Not the soothsayer of the past, but the modern prophet who makes use of twentieth century knowledge to determine the strength of materials used in the products of industry. Through the medium of the radio, fireside gatherings throughout the country recently were told of the romance of engineering materials by one of the leaders of this school of modern prophets. The speaker at this interesting broadcast was H. F. Moore, research professor of engineering materials, University of Illinois, Urbana, Ill., and past president of the American Society for Testing Materials.

PICKLING ---- AT 1/3 THE COST



You, too, will find this to be true when the modern method — the MESTA Patented Pickling Machine — is used and old fashioned methods are discarded.

Not only does the MESTA Patented Pickling Machine reduce Acid costs 1/3, Labor costs 1/3, Time required 1/3, but also a much more thoroughly and uniformly pickled product is the result.

Investigate for yourself this modern method of pickling. This machine will pay for itself quickly in savings effected.

MESTA MACHINE COMPANY

Pittsburgh, Pa., U.S.A.

Mesta

promised by the maker or by his salesman but were shown to exist by actual tests.

Speaking of buying materials on the reputation of the maker without further testing, I remember in my boyhood days the quality of steel in our jack knife blades was judged by the reputation of the maker's name. Back in New Hampshire the boy whose knife blade bore the name Jonathan Crooks was sure he had a superior article. Actually it was not at all difficult to stamp the name Jonathan Crooks on an inferior blade, and blades so stamped were sold.

Fifty years ago there were few standard tests or specifications for any of the ordinary materials in use; today there are some 10,000 well recognized standards for materials. We may decry over standardization, but certainly we should have to do without many modern conveniences if standardized, predictable, materials ceased to be produced.

Tests Show Quality

It is obvious that before any test, whether of strength, wear or color, can be accepted as a standard test for a material it must be shown that the test really shows the presence or the absence of the desired service qualities in the material. Some spectacular tests really tell little about these qualities. There used to be a superstition that if an elephant would set foot on a bridge the bridge was safe. The huge animal was credited with a mysterious and infallible sense of safety. As a matter of fact the slow steady tread of an elephant would not be nearly so likely to cause the bridge to fail as would the banging of a heavy motor truck, and no one ascribes any infallible sense of safety to either the truck or its driver.

But tests which are made with scientific apparatus and which seem scientific may be as lacking in reliability as the elephant test. For example, the resistance of a metal to corrosion is sometimes prophesied from the results of a test in which it is dipped in strong acid for a few moments. The amount of metal dissolved in the acid is taken as a measure of its corrodibility. As a matter of fact a low loss of weight in this test is no proof whatever that the metal will resist ordinary rusting in air and smoke and rain.

Sometimes material is tested by being subjected to two or three times the load it will have to stand in service and if it withstands this test load without fracture it is judged fit for use. This sort of overload testing is rather dangerous. It cannot be safely assumed that because a heavy overload is safely carried once an ordinary load can be carried thousands or millions of times. That one heavy overload may have started tiny cracks in the material and under thousands of repetitions those cracks may spread, like the crack in a glass show case until a shaft or a beam suddenly snaps in two without warning. Most of the failures of materials in airplanes and high-speed machinery are of this class. Fatigue of metals is the name given to the destructive action of these cracks.

Material Should Be Tested

Railway inspectors remove axles from locomotives and from elevated and subway cars after a certain distance has been run and examine them minutely for evidences of the beginnings of such cracks, and if the smallest crack is detected the axle goes to the scrap heap.

Before putting much confidence in the statement that a material has been tested it is well to find out whether it has been tested by *standard methods*, methods recognized by some of the scientific bureaus of the government or by some technical society. It has come to be recognized that in devising tests and standards for materials it is vitally important that the interests of both manufacturer and consumer be considered. If the consumer alone is allowed to write specifications for a material he is likely to set up a number of fussy requirements which do not add much to the reliability of the material, but which do add greatly to the cost. On the other hand, if the manufacturer alone is allowed to write specifications he will almost certainly see to it that the materials shall be easy and profitable to produce. These statements are no reflection on the morals of either consumer or producer: they simply recognize the fact that every man naturally over emphasizes his own viewpoint.

In the American Society for Testing Materials the standards for materials and methods of test are prepared by some 50 committees, committees for steel and iron, for other metals, for concrete, brick, textiles, timber, rubber, etc. Rules of the society require that on each committee there must be representatives *both* of the manufacturer and the consumer. Rarely does the society accept the recommendations for a new standard unless there has been practical unanimity between manufacturers and consumers. That is, a proposed test or specification does not get recognition until a representative group of manufacturers and consumers has talked it over and decided that it is reasonable, safe and useful.

Tensile Testing Intriguing

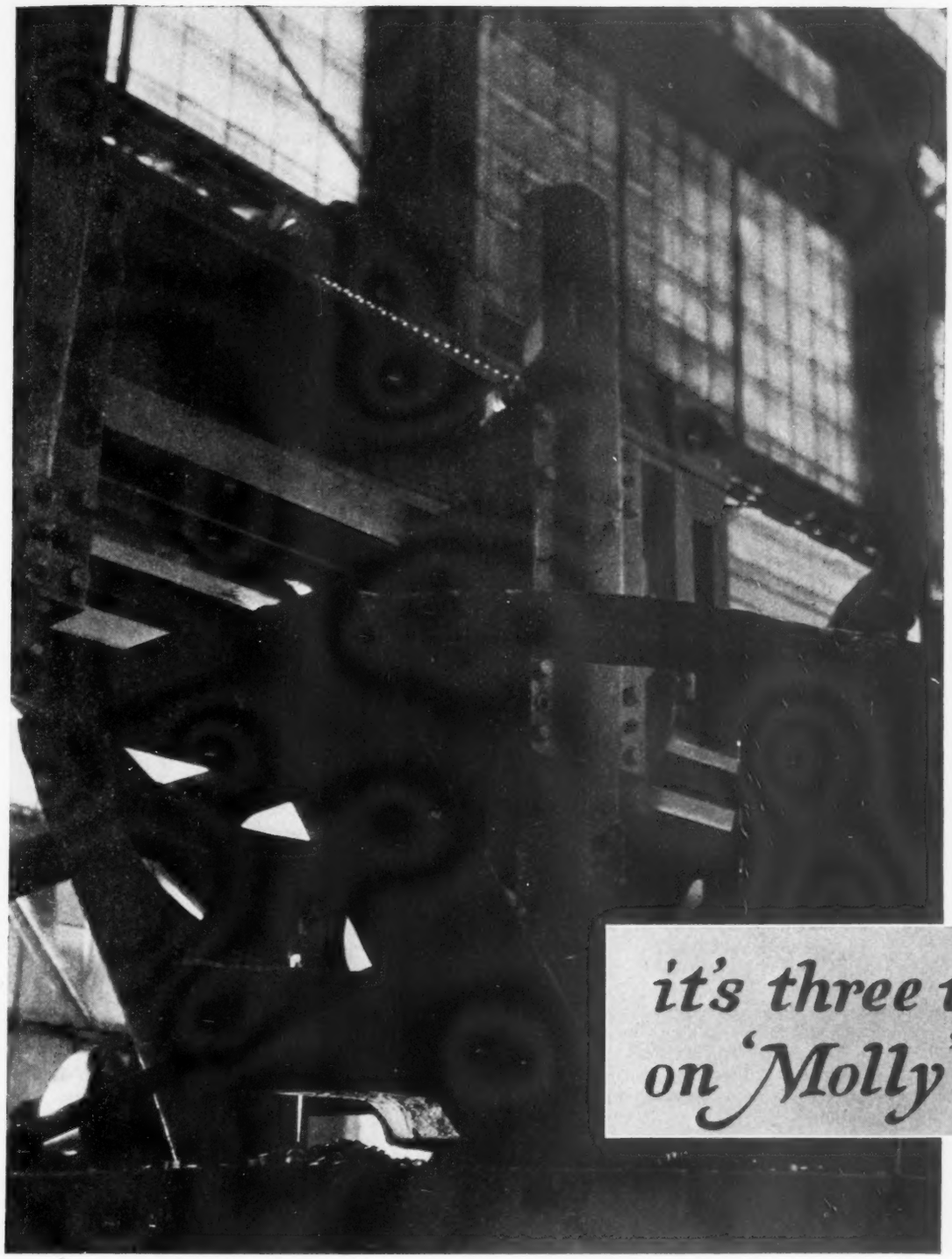
Most of the actual testing of materials is not at all romantic to watch. However the test of a material for strength is an interesting sight to watch. A piece of steel, aluminum, or copper is fastened in a powerful machine and is pulled. It stretches, necks down like a piece of molasses candy, and finally breaks in two with a loud bang. A block of concrete is compressed and finally splits into fragments. A timber beam is bent into a flat bow and finally cracks.

However, to the materials testing prophet the romance of his work lies mainly in what that work means to the millions of men and women who are daily users of materials. He visualizes the aviator successfully handling his plane in the air, trusting confidently that the tested material in his wings, his engine, and his propeller will withstand the severe strains of flying; and in spite of the newness of the art of building airplanes this confidence is rarely misplaced. The materials tester visualizes men and women everywhere protected to an almost unbelievable extent against accidents in the home, on the street, in cars and automobiles by the use of safe, tested materials. He visualizes the farmer, the housewife, the tax payer given full value for the millions of dollars expended for the materials used in building roads, sewers, water pipes, buildings, clothes, railway cars, autos and airplanes. He rejoices that he has a part in increasing the safety and comfort and lessening the dangers of our modern mechanized life, and that he is giving folks more leisure and less anxiety so that they will have more energy available for developing the beautiful and the good in their lives, —if they will only do so.

Wisconsin School Plans Fifth Foundry Conference

Round table discussions and lectures will be closely correlated in the meetings of the fifth annual foundry conference to be held at University of Wisconsin, Madison, Wis., Feb. 3-5. Lectures, presented by members of the department of metallurgy, are planned to provide the background in gray iron, malleable iron and cast steel and will add to this the important developments of the past few years. Immediately following these lectures, round table discussions are to be held, thus utilizing the lecture as the basis and material around which to center the discussion and at the same time providing an opportunity in the groups for the presentation of individual problems.

During the time of the conference, the metallurgical laboratory and the testing laboratory of the university will be open and demonstrations and tests will be carried out for those desiring to witness them. The testing of molding sands and core binders, the calibration, standardization and checking of pyrometers, metallography, metallographic photography, and the testing of tensile, transverse and impact specimens of iron and steel will be among the demonstrations.



it's three to one on 'Molly'

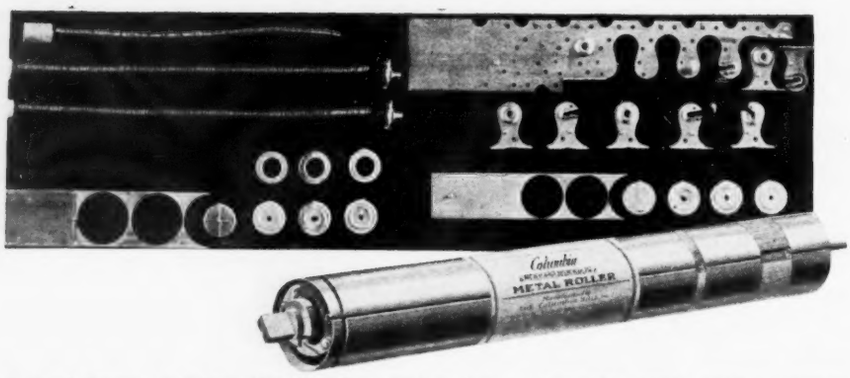
'Molly' does not hang in a pink envelope beneath the shelter of an L staircase . . . Thoroughbred as it may be, its recognition is most perceptible when allied with *copper*—for *copper-moly* forms the guts of Birdsboro 30, and the odds are based on its ability, when used in a dredge cutter, to outrun two to three carbon jobs.

A 7000 lb. cutter is pictured above being groomed for the gravel track in a marine entry. Its tough and enduring frame will float many an added thousand ton to the fill-in.

If it's cast of steel and must be alloy—stake your bets with Birdsboro.

BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA



A steel barrel window shade roller, and a few of the steel parts used in manufacturing and hanging rollers

Large Uses of Steel in Small Ways

183rd Article ◆ ◆ Window Shade Rollers

DESPITE radical changes in the style of house furnishings, the familiar spring shade roller has remained practically unchanged in design and has experienced a gradually increasing demand for a long period of years. The annual production of wooden barrel shade rollers is about 50,000,000, according to the estimate of leading manufacturers.

A typical shade roller consists of a hollow wooden cylinder with a coiled steel spring extending from end to end through its center. The spring is attached solidly by means of a steel stamping to one end of the roll. The other end of the spring is attached to a ratchet and pawl device which prevents the spring unwinding after it has been wound up by lowering the curtain.

Large Sizes Use Steel

Although the great majority of shade rollers are of this wooden construction some steel rollers are used for the large sizes of curtains. These are usually made of cold rolled sheet steel tin plated. The sheet is rolled over circular end stampings and welded to form the cylinder.

The regular demand for shade rollers is supplied in 15 different sizes. The weight of the spring in these different rollers varies from 7 pounds to 100 pounds per gross and the weight of the average size spring is estimated at 15 to 20 pounds per gross.

In the majority of rollers the spring is made of a special manganese steel wire. The carbon content is moderate in the steel because the spring must be somewhat soft. On the basis of 50,000,000 shade rollers a year the annual steel requirements for springs figures about 2700 tons. In addition to this another 2500 tons of steel is used in the end pieces, most of which are stampings.

Weight Estimates Vary

It is difficult to estimate the weight of steel in the all-metal rollers. One authority has placed the number of shades made of metal at 4 per cent of the total and of this number he estimates 1 per cent to be of brass or nonferrous metal. This would leave 3 per cent or 1,500,000 rollers made of steel. The average weight of a steel roller is estimated at two pounds which gives a total weight of 1500 tons not including the springs which have been previously considered.

Totaling all of this it seems clear that the roller shade industry accounts for more than 7000 tons of the country's annual steel production and yet this figure, large as it seems, does not include the brackets used for holding shades which are omitted here because they more properly belong in the classification of curtain rods and brackets. The leading manufacturers estimate that from 7 to 10 per cent of the shade roller production in this country is exported.

While not ordinarily included under the classification of window shade rollers, the rollers used in enclosed automobiles are of similar construction. Most of the automobile shade rollers are made of small tubes of tin plate, joined by forming and pressing, without welding. The total production of automobile shade rollers in this country is approximately 150,000 to 175,000 per month, and judging from average weights about 450 tons of steel is consumed annually in their manufacture.

Conference To Review All Methods Used in Welding

Demonstrations of the latest equipment, materials and methods used in the various welding processes and problems of welding as applied to manufacturing, maintenance, and construction are to be the topics presented at a welding conference to be held at Case School of Applied Science, Cleveland, Feb. 19-20. At the two-day meeting, under the direction of the school and Cleveland Engineering society, special emphasis will be given to the design of welded structures and machines, and to the influence of welding on the proportioning of such structures and machines.

Subjects to be presented include: New developments in welding; thermit welding; oxyacetylene welding; arc and atomic hydrogen welding; fusion welding of pressure vessels; welding of machine parts and frames; welding of pipe lines; designing for welding; testing welds and welders; and welding of structures. Exhibits and demonstrations planned for the meeting are as follows: Gas welding and cutting; thermit welding; atomic hydrogen welding; automatic arc welding; resistance welding; welding special metals; and testing welds and welding materials.

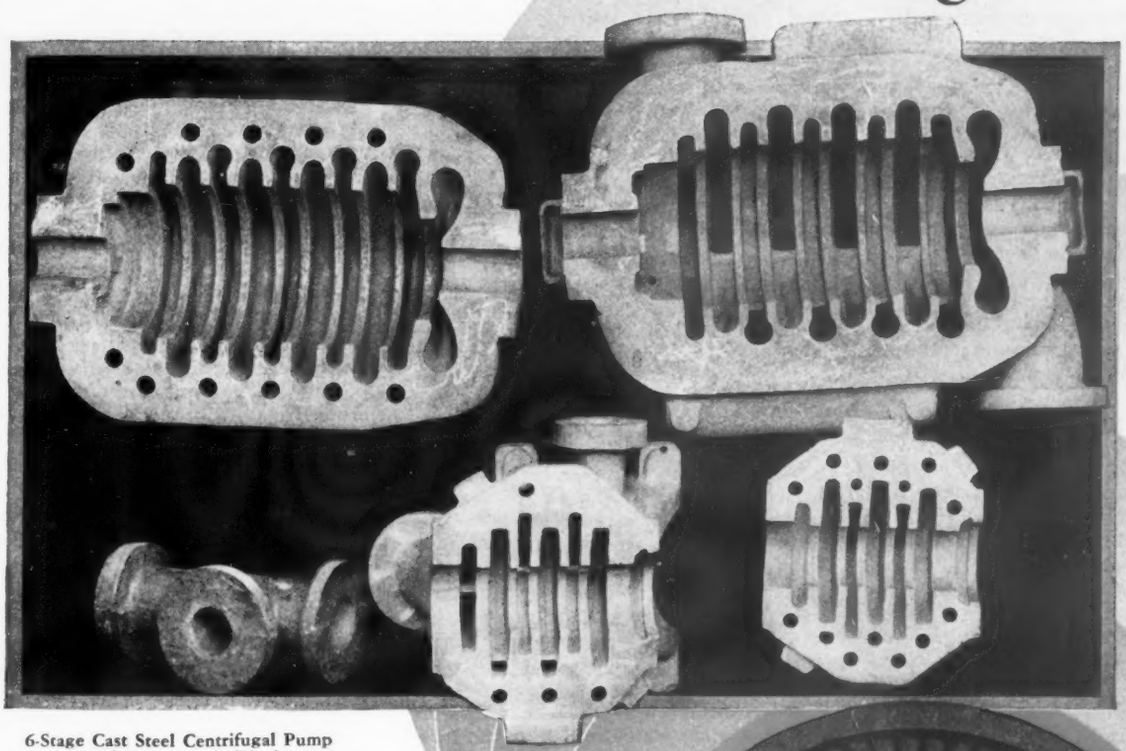
Foundry Managers Discuss Obligations to Workmen

Over 100 foundry managers, superintendents and foremen assembled in Cleveland, Jan. 17, to consider problems relating to foundry management. The meeting was called by the committee on industrial education of the National Founders' association.

Dr. Harry Myers, consulting industrial engineer, Dayton, O., spoke on the relationship of workmen and foremen and their joint responsibility in establishing order and cleanliness. A. D. Lynch, personnel manager, Ohio Brass Co., Mansfield, O., emphasized the fact that foundry workmen do not ask for welfare or paternalistic activity from the management, but they do expect the management to provide a proper place to work, proper equipment, adequate wages, continuity of employment, opportunity to advance and proper leadership. L. W. Olson, factory manager, Ohio Brass Co., spoke on management's opportunity and responsibility and emphasized that honesty and fair dealing are the fundamental concepts upon which management must build.

TREADWELL

Electric Steel Castings

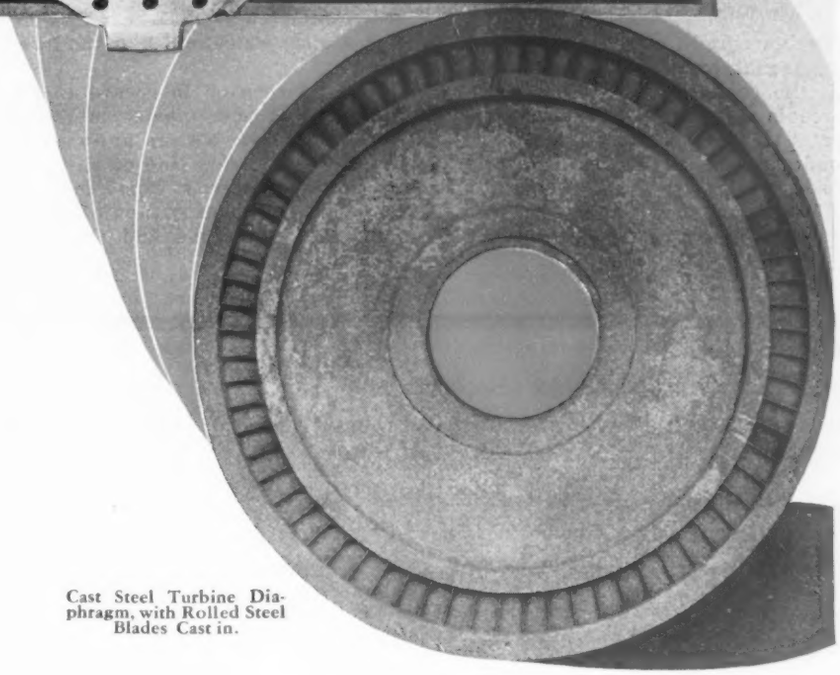


6-Stage Cast Steel Centrifugal Pump Casing and Cover, with Diaphragms Cast Integral. Subject to 1,700 lbs. Pressure. (Inside View)

TREADWELL

Products Include

Rolling Mills
Straightening Machines
(Abramsen Design)
Tube Threading and Cutting-Off Machines
Special Machinery
Hi-Test Iron Castings
Electric Steel Castings
Alloy Castings



Cast Steel Turbine Diaphragm, with Rolled Steel Blades Cast in.

BETTER GRADE MACHINERY

Treadwell Engineering Company

Easton, Pa.

Rolling Mills—Threading & Cutting-off Machinery
Special Machinery—Iron & Steel Castings

Statistics on Machine Age Refute Common Theories

BY FRANKLYN HOBBS

Director of Research, Central Trust Co. of Illinois

IN 1891 the writer conceived the idea that business men did not possess a sufficient amount of dependable information on general financial and commercial operations, and so began the gathering and arranging of statistical facts on business operations. Being located in a mining country, his initial effort was the collecting and correlating of figures covering, production, distribution and consumption of metals and minerals.

Exactly 33 years ago, it was announced by authorities that the known coal deposits of the United States would be exhausted in 33 years, should the then rate of consumption continue. We have lived through those 33 years, and, in spite of the fact that we have multiplied our coal consumption several times, the latest dependable estimates of the known coal supply show it to be sufficient to last 7000 years at the present rate of consumption.

Misinformation Prevalent

The purpose in reviewing 40 years of personal experience is to prove that the commonest article of commerce is misinformation on fundamental things. The distribution and broadcasting of such misinformation caused a mild business recession in 1930 to develop into a serious and painful business depression. If every man in America had been in possession of knowledge which was possessed by some thousands of real students of business conditions, this depression need not have been any more serious than the mild business recessions of 1924 and 1927.

The "fishwives' tales" that were repeated to the writer during 1930 by business men who believed themselves to be well informed, were disgusting. For instance, hundreds of important failures or impending failures were reported when there was never even the remotest possibility that such failures would occur. Every man thought that he had some inside information on a distressing condition which might set the country by the ears. As a matter of fact there is no inside information except that actually possessed by insiders. The outsider who thinks he holds inside information should command just the same attention as the man who furnishes the "inside dope" on the winning horse or who offers to sell a system which will beat the faro bank.

Real information in regard to all operations of consequence is available to all of us. We can know what is going on in every line of business and financial activity. Some men of large affairs and many men of small affairs lack the time and facilities to dig up all of this information for themselves, and thus a job is provided for the writer and others, whose function it is to collect, correlate, and disseminate the real facts regarding fundamental business operations.

In the course of our work, we chanced to draw off comparative figures from the census of manufactures of 1899 and that of 1921. A cursory comparison of these figures revealed a surprising thing. If this thing was a fact, then every manufacturers' association, many of the leading manufacturers, and every labor union in the manufacturing field has been barking up the wrong tree. Further investigation conclusively proved that finding to be an indisputable, unassailable, incontrovertible fact, and the most important fact with which the machine tool industry ever has been faced. This fact is that the introduction of automatic and labor-saving tools and appliances into the manufacturing industry has not reduced the amount of money paid to labor by that industry and has not been able to displace workers in certain industries as rapidly as avenues of employment have been opened up to them in other industries.

Unit Pay Increases

During the last 30 years, time-saving methods and tools have driven two workers out of every three away from the bench and left the third man drawing just as much pay as the three men had drawn before the tools arrived. Moreover the two men were driven from that bench to other benches at an increased wage in every case. It is easy to prove that machinery has thrown thousands of men out of jobs, but it is just as easy to prove that machinery has driven everyone of those men into new jobs at higher pay. Every man who works

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PROPAGANDA against mechanization of industry, on the ground that it has saturated equipment markets and caused technological unemployment, has been actively circulated lately by sensational theorists who have neglected to support their pessimistic statements by facts. Unfortunately, this propaganda has achieved widespread credence during the period of depression, which it probably aggravated.

Aroused by this situation, industrialists and economists of unquestioned authority, who are armed with convincing facts and figures, are rising to the defense of the machine age. Ernest F. DuBrul, general manager, National Machine Tool Builders' association, in his article in the Jan. 1 issue of STEEL, dealt a telling blow at the foundation of reports of industrial equipment saturation.

Franklyn Hobbs, director of research, Central Trust Co. of Illinois, in the accompanying article, deals an equally effective blow at carelessly accepted beliefs regarding technological unemployment. These significant remarks and supporting figures which were presented before the Machine Tool Distributors of Chicago on Jan. 9, will be appreciated by all those who maintain faith in industrial progress.

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in a factory today earns three times as much money as his father earned at the beginning of the century for doing the same work.

At the beginning of the twentieth century this country had a population of 76,000,000 persons, 6 per cent of whom were employed in factories. At the beginning of 1930 this country had a population of over 121,000,000, 7 per cent of whom were employed in factories. It is apparent that the demand for factory workers has increased faster than the population has increased. This increased employment for factory workers must have been directly due to the introduction of machinery, because the gain in factory employment was not so great in any other country on which records are available, and facts on this phase of the question are quite convincing. While there has been some variation in the portion received by the worker and, naturally, a similar variation reversed has operated upon the owner, the average for a period of 30 years ought to be a fairly reliable basis on which to form a judgment. During that period the workers' share of the value added to raw materials through hand and machine and work has varied from 36 to 43 per cent. The average for the 30 years has been something over 40 per cent received by the workers and 60 per cent received by the owner. Whether this division be fair or not, it is exactly as it has been since consolidation of manufacturing enterprise and mass production with the aid of tools has 30 years ago and he continues to receive 17 per cent as his share. He was receiving 40 per cent of the value added to raw materials through manufacturing processes and he still is receiving 40 per cent. There were 4,700,000 of him at work in the mills 30 years ago and there were 8,500,000 of him at work in the mills in 1929. Only 6 per cent of the population was required to man the factories 30 years ago, but now it requires 7 per cent of the population to do the work.

Going outside of manufacturing enterprise and looking at the whole picture of the country's workers, whether they be laborers or of the so-called white collar class, another surprising fact regarding employment becomes evident. It is that,

Factory Employment Statistics

Year	Total value of products, millions of dollars	Value added by manufacture, millions of dollars	Value added to material by each worker, dollars	Total number of workers	Amount paid each worker, dollars	Per cent of added value received by workers	Per cent of total value received by workers	Population of U. S. on July 1	Per cent of population employed in factories	Number of persons gainfully employed*	Per cent of population gainfully employed
1899	11,407	4,831	1,025	4,713,000	426	42	18	74,799,000	6	29,073,000**	39
1904	14,794	6,294	1,151	5,468,000	477	41	18	82,601,000	7	.....	....
1909	20,672	8,529	1,289	6,615,000	518	40	17	90,691,000	7	34,255,000	38
1914	23,975	9,708	1,408	6,895,000	590	42	17	97,928,000	7	37,782,000	39
1919	62,042	24,809	2,757	9,000,000	1,162	42	17	105,003,000	9	40,282,000	38
1921	43,619	18,327	2,639	6,944,000	1,181	45	19	108,197,000	6	40,819,000	38
1923	60,530	25,846	2,945	8,777,000	1,254	43	18	111,511,000	8	42,156,000	38
1925	62,668	26,771	3,194	8,382,000	1,280	40	17	114,826,000	7	43,844,000	38
1927	62,718	27,585	3,304	8,350,000	1,299	39	17	118,141,000	7	45,747,000	39
1929	68,453	31,096	3,637	8,550,000	1,318	36	16	121,455,000	7	.....	....

*Findings of National bureau of economic research.

**U. S. census 1900.

increased factory employment elsewhere occurred in proportion to the introduction of improved machinery. This furnishes mathematical proof that the introduction of machinery in manufacturing operations has not caused unemployment.

The wage side of the question may be dismissed with the simple statement that when this century began the factory worker was earning $426 per year, while the factory worker of 1929 was paid $1318 for his efforts. Factory employment increased 16 per cent faster than population, while factory wages increased more than 200 per cent, which should leave no question as to the effects of machinery on employment and on wages.

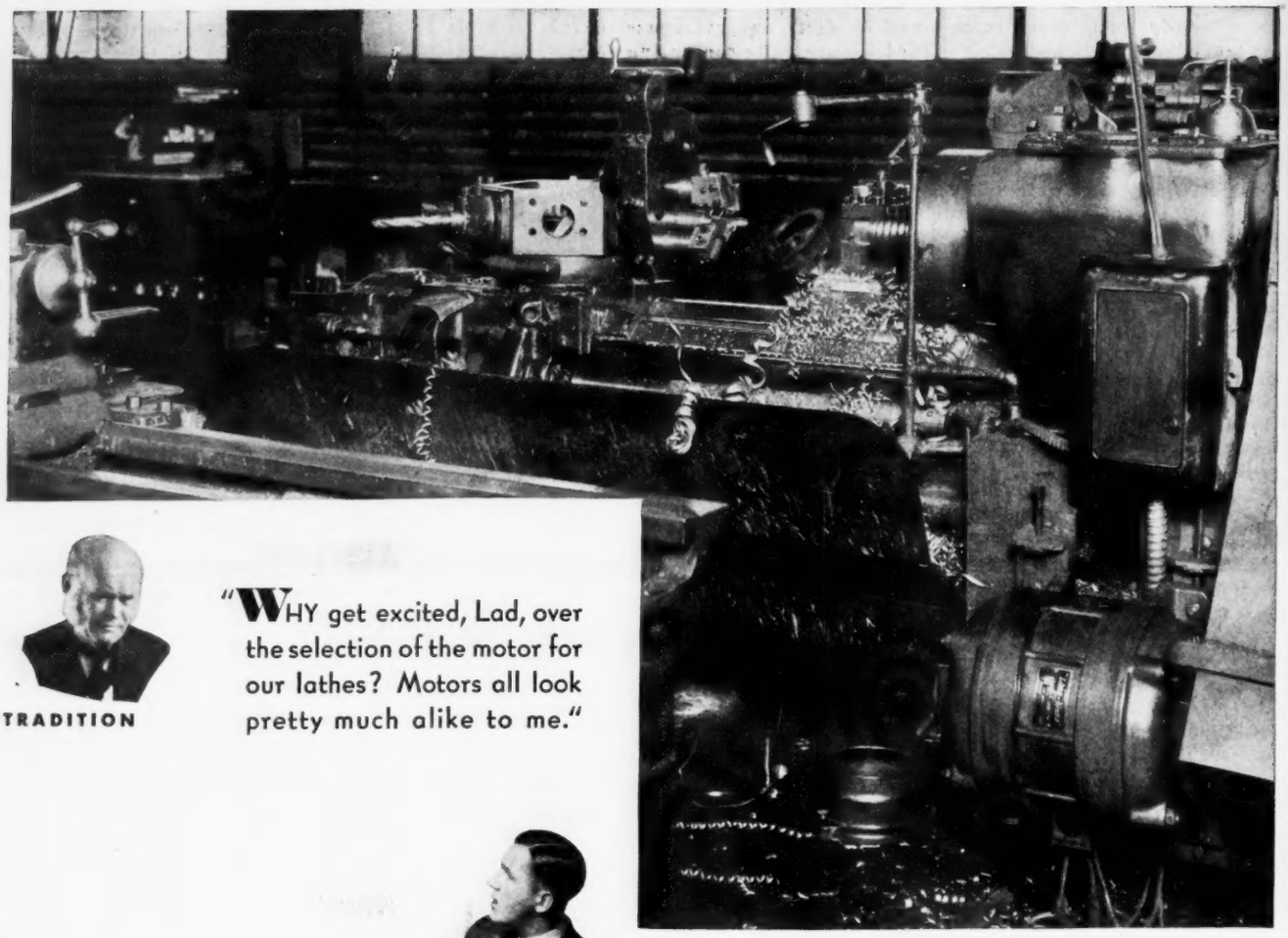
This brings up the much discussed question as to whether the worker is getting his fair share of the reward. Figures already given prove the great gain in employment, and the greater gain in wages, but the worker has been told that, through vast combinations of capital and through mass production, the owner constantly is obtaining a larger share of the profits. Mathematical been in vogue, and an unjust practice is not likely to continue for 30 years in a country like the United States. It is fair to assume that labor is entitled to 40 per cent of the value added to raw materials in the process of manufacturing, which is just what it has been getting and just about what it is likely to get in the future.

Workers Profit

Another important figure, which tells the whole story about capital invested and the effect on labor, is the one showing the portion of the actual selling price of the product which goes into the pay envelope of the factory worker. Since 1900, the portion of the total value of factory output received by workers has varied from 16 to 18 per cent. In 1899 and 1923, the worker received 18 per cent of the total value of manufacturing production. In 1929, the workers received only 16 per cent. In every other year, the worker's share has been 17 per cent and the average during 30 years has been 17 per cent. The worker was receiving 17 per cent of the total value of the product of the factory while a generation ago, only 38 per cent of the whole population was gainfully employed, more than 39 per cent of the whole population is now so employed. In order that we may be supplied with the goods and services which our present mode of living demands, it is necessary for an increasing portion of our population to work. It is the conclusion of the writer that shorter hours and longer vacations are responsible for the 3 per cent increase in the section of the population which must work for a living, and for the 16 per cent increase in the section of our population which must man the factories. If we go any further in the shortening of hours, it will be necessary for an additional number of people to don the overalls or the office coat and go to work.

A recent report of Commissioner Ethelbert Stewart of the bureau of labor statistics, shows figures which disagree with those just given because Mr. Stewart has seen fit to take the period of 80 years from 1849 to 1929. The writer is uncertain as to just what his figures are intended

(*Concluded on Page* 50)



TRADITION

"WHY get excited, Lad, over the selection of the motor for our lathes? Motors all look pretty much alike to me."

PROGRESS

● Lincoln "Linc-Weld" motors drive all the lathes and other machine tools in the large manufacturing plant where this view was photographed.

"So do eggs, Pop, until you open them. But unlike eggs, motors can be taken apart and investigated before you buy.

You'd get excited too, Pop, if you'd take the time to investigate Lincoln 'Linc-Weld' motors like I have. Here's what I've discovered about 'Linc-Welds'. They have an arc-welded rolled steel frame which means strength and rigidity—more copper and iron in the working parts—larger openings in frame for air circulation—28 gauge laminations instead of the usual 26 gauge—larger shaft through motor and large bearings—permanently plastic insulation which won't dry out and crack—and, Pop, the workmanship is a sight for any machinist's sore eyes.

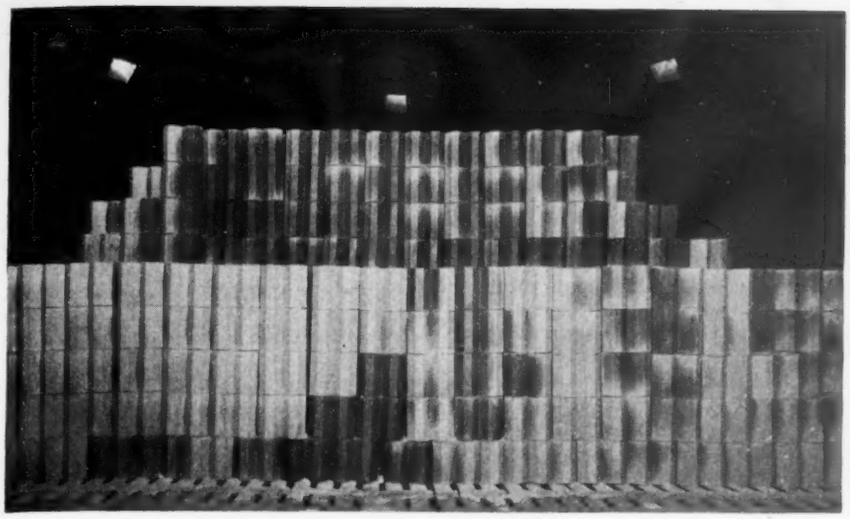
There's no gamble in selecting 'Linc-Weld' motors as in buying eggs—and no regrets."

THE LINCOLN ELECTRIC COMPANY

Department No. 20-1 Cleveland, Ohio

M-82

LINCOLN "LINC-WELD" MOTORS



Improvement in size and shape control of refractories was a noticeable trend during 1930

Manufacture of Refractories Tends Toward Uniformity

BY H. M. KRANER
Westinghouse Electric & Mfg. Co., Derry, Pa.

IN REVIEWING the developments in refractories for 1930, one must not overlook the minor improvements which result from contemplation and rational consideration of economic conditions during the present "marking time" period of business. These adjustments are highly important to the user of refractory material and he must admit a definite improvement in size and shape control of clay refractories, a trend toward greater uniformity of quality, and perhaps uniformity of manufacturing processes in respective ceramic plants. The latter is particularly true of clay refractories in which there is a growing tendency toward dry pressing, clay brick being made equal in quality to many brands of wet process bricks. Some of this trend toward dry pressing has been necessitated in order to reduce costs. The quality has been maintained through better understanding of grain size and pressure control.

Zircon Bonded Successfully

In the field of special refractories, zircon has been bonded successfully and results obtained indicate that the tendency of this material to spall has been overcome. The resulting refractory is particularly desirable for acid melting operations of high-grade metals. Early attempts to bond this material met with failure, the material usually spalling in spite of the low co-efficient of expansion of the mineral itself.

Magnesia has a high co-efficient of expansion and its failure as a refractory is usually by spalling, as might be expected. This has been found to be due to the bond also, and to some extent to the degree of prefiring the raw material. Electric furnace practice in the melting of minerals has become so common that the production of magnesia by this method makes it economically reasonable to use electrically fused magnesia for furnace linings, for small installations at least. This is much more suitable than an ordinary calcined magnesia refractory from the standpoint of spalling.

During the last few years bonds for super refractories have received the attention which they deserve. Without a suitable bond the most refractory material would not make a suitable lining for any furnace; likewise a bond which is not permanent after being put into use is not suitable. In short, the bond itself must consist of phases or constituents known to the mineralogical chemist as compatible phases.

Perhaps the most notable developments in refractories for steel melting have at least been matured in the past year. In the past 10 or 15 years ceramic and mineralogical chemistry has been aided tremendously by X-rays, the petrographic microscope and perhaps most of all, the high-temperature equilibria studies of such laboratories as the government geophysical laboratory.

With these tools, the mineral constituents and structures of dolomite furnace bottoms, the mineral or glass bonds of refractories, and many other problems such as the dusting of dolomite bricks and bottoms have been explained.

Magnesia Bonds Developed

The great insolubility of magnesia in silicate melts as indicated on the phase rule diagrams which have been worked out explains in part the statement that is often made that magnesia is our greatest refractory. Until recently its bond was the big question. A careful study of the CaO-MgO-Fe_2O_3 system simultaneously by an American and a German has resulted in two patented products of somewhat similar and unique properties. Both of these are extremely refractory, yet their bond consisting of compatible phases which melt at a low temperature carries the magnesia into solution only slowly with temperature increases.

These products therefore are such that they may be used as ideal patching materials because they are sticky at furnace temperatures. They are sufficiently viscous, however, that they do not deform. As patching materials it is possible, by means of an iron rod, to make indentations on them while in use, which indentations remain, demonstrating how plastic the material seems to be while in use and how readily patching may be accomplished.

Developments such as these have given a great impetus to refractories research in the plants of a number of progressive steel plants in this country. They represent commendable success for those scientists who have utilized these branches of science in unraveling the mysteries of furnace bottom mineral relations at high temperatures.

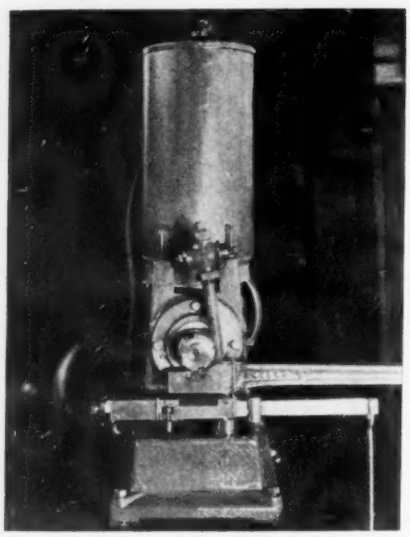
Causes of Boiler Plate Embrittlement Studied

Embrittlement in boiler plate is caused by the combined action of stress and chemical attack, according to research Bulletin No. 216 of the engineering experiment station, University of Illinois, Urbana, Ill., entitled "Embrittlement in Boilers," by Frederick G. Straub, professor in chemical engineering of the univerity. The stresses are inherent in the construction and operation of the boiler, while the chemical attack is caused by the presence of sodium hydroxide in the boiler water.

Devises Machine for Testing Efficiency of Lubricants

AN APPARATUS for testing the load carrying capacity of lubricants recently was developed by the Timken Roller Bearing Co., Canton, O., for use in the company's laboratory as a means for obtaining accurate information on the effect of different lubricants on hypoid and spiral bevel gears in automotive axles, and to test lubricants in connection with many intricate industrial bearing problems.

The apparatus consists essentially of a cast-iron base which supports the testing mandrel, two levers and a container holding about a gallon of the lubricant to be tested. The tank is mounted on top of the base, and beneath is an electric heater, used to raise the oil to any desired temperature up to 210 degrees Fahr. The oil flows from the tank, over the test piece, to a sump in the base by gravity, the rate of flow being adjusted by a valve in the line. From the sump, the oil is returned to the tank by a small pump located in the base, and belt driven from the testing mandrel. The latter extends through the base, and may be either direct or belt driven by a variable-speed fractional-horsepower motor. The mandrel is mounted in two tapered roller bearings, so arranged as to hold it rigidly in alignment and is tapered at the test end to receive the tapered cup of the bearing. This cup, which forms one of the test pieces is held in place firmly by a nut on the end of the mandrel, which is threaded to receive it.



Close-up view showing balanced lever system with test block in position

The lever system, which is the most important part of the device, consists of two levers, one above the other. The upper is called the load lever, and the lower the friction lever, for reasons that will appear. The upper, which carries the test block is pivoted on a knife edge, mounted in the lower lever. The latter also is pivoted on a knife edge and is provided with a stop at the unloaded end. By this arrangement the test block always is parallel to the revolving cup and the unit loading over the length of both pieces always is constant.

Test Piece Is Hardened

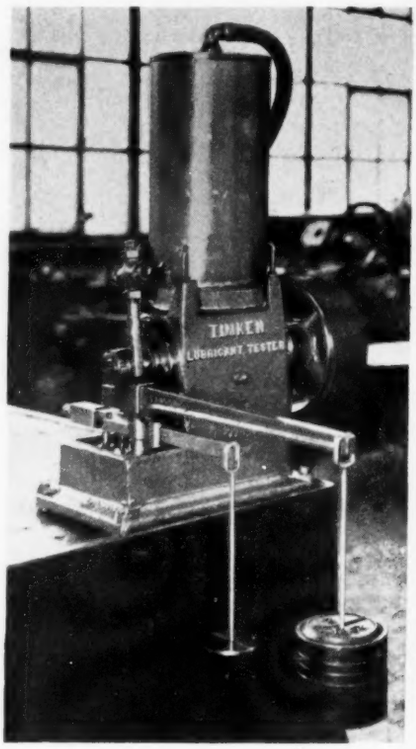
The test block is a small piece of metal about ½-inch square and ¾-inch long hardened to Rockwell C-60 and ground. It is inserted in a notch in the loading lever and held in place by a wedge. If case bearing metals are to be tested both the test block or the cup or both can be made of the appropriate material. The friction lever is provided with a vernier scale, and a sliding weight for obtaining accurate measurements and both levers are equipped with hangers for carrying adjustable weights. A welded-steel housing is provided to cover the end of the mandrel and levers.

The operation of the device is substantially as follows: Assuming both test pieces in place, the driving motor or lineshaft is brought to the desired speed, and the lubricant heated to the required temperature, is allowed to flow over the test block. The loading lever then is loaded by weights until the desired unit pressure is obtained between the test pieces. A chart is furnished with the apparatus which gives the necessary weights on the loading lever per 1000 pounds of unit pressure. If only the load carrying capacity of the oil is to be determined, the test block is removed after 30 minutes running, and examined for signs of scuffing. The degree of scuffing determines the relative load carrying capacity of the lubricant.

In case the coefficient of friction of the lubricant is desired, weights are added to the friction lever until it moves away from the stop. Loading the upper lever causes the friction on the test block to move it forward horizontally, unbalancing the friction lever until it rests on the stop. This condition is compensated by adding the weights on the friction lever, until the system is again in balance and the lever is off the stop. The co-efficient of friction of the lubricant then is calculated from the amount of weight it takes to balance the levers.

It would be a simple matter if extreme accuracy in this regard was needed to provide a make or break electric circuit between the lever and the stop that would indicate, by a lamp or some other device, exactly when the correct weight is reached. The same holds true, of course, in case different bearing materials are being tested. Not the least interesting feature of the machine is the permanence of the records it provides. The condition of the test block can be examined at leisure, as a means of analyzing the effectiveness of the lubricant under test.

The results obtained during the course of testing were so valuable from many standpoints that it was decided to further perfect and market the apparatus. Its usefulness is not confined to laboratory or automotive work; it is suitable in industrial, power and other plants to determine the efficiency of lubricants for given conditions of service. In addition it can be used with equal effectiveness to obtain data on the relative efficiency of different bearing metals under various conditions of load, speed, temperature, or with different lubricants. And, finally, it is so simple that it does not require any particular training or skill to produce accurate results.



General view of newly developed machine for testing lubricants and bearing metals

SMALL STAMPINGS MADE BY CROSBY

What a riot on this page if we should try to show them all! Instead, here are a few samples with which we strive to show that in gauge of metal, size or difficulty, there are practically no limits to Crosby ingenuity in this division of making pressed metal parts.

Our 35 years of business life have developed a vast and capable organization qualified in many ways to save you money and assure you satisfaction.

We work in zinc, brass, copper, duralumin, aluminum, open-hearth, hot or cold rolled, high carbon or stainless steel.

The catalog contains 22 pages of dimensioned illustrations of work we have done. These samples, we believe speak louder than words. Wouldn't you like to look at them?

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Corrosion-Resistant Steels Meet Industrial Demands

LAST year witnessed an increasing diversification in the applications of nickel to the industrial life of the world although, because of the business depression, a setback was suffered in the volume of nickel marketed, according to a recent review by the International Nickel Co., New York. The year's feature was the rapidly increasing use of corrosion-resistant steels of the nickel-chromium type.

Because of their stability and strength at high operating temperatures, steels of high-nickel and chromium content have found an important place in the petroleum industry, with a growing demand in 1930 which considerably outstripped that of the peak year, 1929, despite substantial curtailment in the production of petroleum products. Further expansion of nickel tonnage may be expected in the petroleum field, which is beginning to accept, in addition to the stainless steels, certain nickel-bearing cast-iron alloys of good corrosion-resisting qualities, and also pure nickel strainers for the bottom of the deep wells.

While monel metal held its own in its fields of commercial laundries and food service equipment for hotels, restaurants, hospitals and other institutions, it has gone into new fields dependent upon mass production methods, such as the frozen food industry.

Nickel Consumption Declined

Consumption of nickel for the production of alloy steels, as yet the backbone of the nickel industry, fell off substantially during 1930 because of radically curtailed automotive production. The decline, however, was not so great as the curtailment in automotive schedules because of an increasing use of nickel steels by manufacturers of glassmaking, paper, sugar, road building, mining, textile and similar heavy duty machinery.

There is a growing belief on the part of many of the railroads in this country and in Canada that low-carbon nickel steels can be employed advantageously in the construction of locomotives. Incidentally, cast-nickel steel locomotive frames now have been in service long enough to show that they constitute an advantage where alternating stresses, due to weaving motion, require a more resistant, tougher material. This thought of toughness and wear resistance in alloy steels is being taken up by a great number of diversified interests in industry which points toward a continuing growth of tonnage in cast-nickel steels. In fact, this growth was so substantial during 1930 that consumption of nickel for cast steel last year exceeded that of 1929, the peak year.

Because of conditions in the automotive industry, consumption of nickel for cast iron was reduced materially; but here again progress made with this product among manufacturers of other types of heavy-duty machinery prevented a more serious decline.

Use for Heating Expands

Heat-resistant alloys containing from 5 to 80 per cent of nickel have become standard materials for heating elements for electrical thermal equipment, both industrial and domestic. Rapid expansion in the use of electrical energy for thermal operations has been reflected in increased nickel consumption by the producers of alloys of this type. Consumption of nickel for the production of heat-resistant furnace parts, containers and similar industrial applications fell off sharply during 1930, because of curtailed operations in the fields where castings of this type are most widely used, but a steady expansion of the use of thoroughly proved alloys of this type may be expected as conditions return to normal.

Adoption of more enduring standards by the large users of electroplated equipment, and the development of the technique of plating along scientific lines, has resulted in a vastly improved quality of nickel plate. There is a decided trend toward white metal trim as evidenced by the popular chrome-on-nickel finish, and as the tvpe of coating now available is both durable and attractive, consumption of nickel should increase materially with returning confidence in the performance of plated ware. In this connection, it is interesting to note that practically all the chromium plate now produced consists of combinations of layers of copper and nickel with a flash of chromium superimposed.

The bureau of standards, Washington, has announced that the simplified practice recommendation covering abrasive grain sizes has become effective as standard practice. Sufficient acceptances received from interested companies and individuals since its presentation, June 11, 1930, have assured its adoption.

Describes Heat Treating in Controlled Atmospheres

Carburizing, nitriding and other heat treating operations performed in the vertical pressure electric furnace was described by H. E. Koch, Hevi Duty Electric Co., Milwaukee, before the Cleveland chapter of the American Society for Steel Treating, Jan. 12. Control of furnace atmosphere is a subject of growing importance, thus the meeting developed into an interesting round-table discussion.

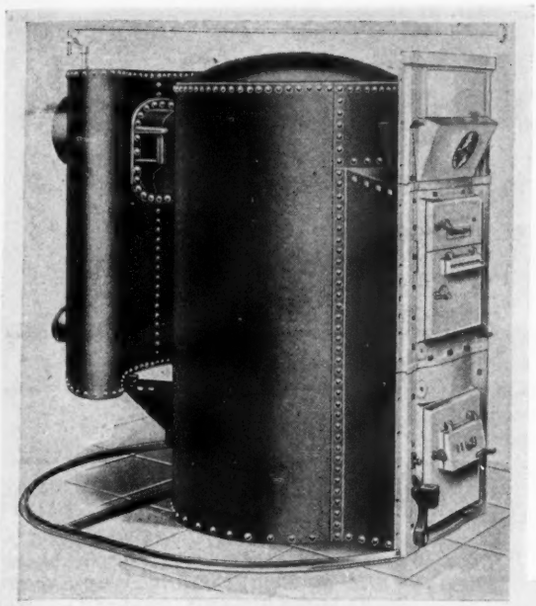
In the new process, work to be treated is loaded into a perforated basket and placed in the furnace retort, the cover of which includes an electric fan for agitating or circulating the atmosphere. Gas is introduced into the retort either by pressure tanks or by dripping liquids into the chamber where they are instantly vaporized. Several types of gases and liquids are finding use. Pressures up to 15 pounds per square inch can be utilized in the retort, although 7 to 8 pounds appears to be the normal.

Statistics on Machine Age Refute Common Theories

(Concluded from Page 45)

to prove, but he feels certain that they did not prove anything of great importance because they make a flying leap from 1849 to 1929 without reference to the intervening trends. This report is mentioned because it may prove that the introduction of labor-saving machinery was the salvation of the factory worker. If the condition shown by the bureau of labor report had not been altered by the introduction of machinery during the last 30 years, the factory worker might have found himself at this time in a most unhappy plight.

It is important that these facts become known as soon as possible by every manufacturer, every stockholder in a factory, and every factory worker in this country. When they are fully realized most of the labor disputes in factories will settle themselves. The labor demagog who rants about machinery causing unemployment then will have to find a small hole, crawl into it, and pull the hole in after him, because actually the machine age has increased employment, increased wages, made work easier, saved lives and limbs, and has enabled the working man to live in comfort and luxury unknown to any man on earth when some of us were born.



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Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

FABRICATION:

Rust-Resistant Coatings

Hot dipping to inhibit corrosion, discussed by L. K. Wright, in American Machinist, Jan. 8, p. 58, 1½ pp.

To obtain a thoroughly adherent film the article must be clean. The author discusses briefly various means for cleaning the surface including tumbling, sand blasting and pickling. Coating with molten metal is done in steel pots. Oil or gas-fired furnaces, automatically controlled, provide excellent heating means. As soon as clean parts to be treated have dried after the pickling process, they are immersed in a bath of either zinc or cadmium and are passed slowly through the salammoniac cover so that the surfaces are fluxed, and no sputtering of hot metal occurs. Parts are allowed to remain submerged until their temperature is the same as that of the bath. Parts then are withdrawn slowly. The article should be jarred sharply or brushed to remove surplus metal or flux. If a spangled appearance is desired it can be produced by sprinkling with water and allowing the parts to cool in air. Proper care of metal baths is cited.

—STEEL 1-22-31

Welded Plate Joints

Classification and physical tests for various types of weld-fabricated joints, by G. R. Exley, in Journal of American Welding society, December 1930, p. 27, 16 pp., 8 illusts.

Ample reinforcement and fillets of proper size offer the most practical means of insurance against failure by irregularities in the weld metal and structure and by overstraining due to incidental bending stresses. The weld should be as nearly symmetrical as possible with just sufficient reinforcement to meet the strength requirements. Ductility is a highly desirable quality in mild steel weld metal when used for structural welding. Lack of penetration is one of the most common faults to be found in a welded joint and is detrimental when bending is present. Two likely sources of explanation as to the circumstances out of which abnormalities arise in welded joints are strain hardening by cold working and rapid deformation such as might approach the nature of impact as from a single blow.

—STEEL 1-22-31

USES:

Spring Steel

Data for steel used in the manufacture of automobile springs, fenders and gears, presented by J. W. Urquhart, in Heat Treating and Forging, November 1930, p. 1412, 6 pp.

One example of features of change and progress is afforded by suspension spring production. For a long period the medium and upper carbon-manganese steels were regarded as unsurpassed by any for spring leaf making. The quality of this steel gradually improved until it attained a certain standard.

The upper critical of this higher carbon steel was around 1350 degrees Fahr., and it usually was heated in open furnace to permit of quenching in oil, to 1500 degrees Fahr., suddenly cooled in the quench, and, while still hot, tempered down to 600 degrees Fahr. In this condition its elastic limit was shown to be 136,440 pounds per square inch, with a brinell hardness of 388 (scleroscope 46) with a bend-rupture angle of 60 degrees.

A great improvement was brought about in the production of suspension spring leaf production by adopting measures for surfaco protection and absolutely perfect uniformity of hardness, by salt-bath treatment. Springs of the laminated type are, at the present time, built up from leaves that retain the clean, smooth finish they receive in the last rolling phase. This surface is further sand blasted and ground by a kind of rough buffing, resulting in a fine surface, insuring intimate contact with adjacent leaf surfaces when the spring is made up. A laminated spring of this type holds its lubrication and has a cushion-smoothness of action.

—STEEL 1-22-31

PRODUCTION:

Foreign Refractories

Use of refractories in typical German open-hearth furnaces, discussed by R. M. King in Engineering Experiment Station News, Ohio State university, Columbus, O., January 1931, p. 8, 1 pp.

Port ends last about 270 heats and are removable. Roofs last 500 to 600 heats as compared with American practice of 300 heats. The top third of checker settings consists of silica brick and the lower two-thirds of fireclay brick. Open-hearth bottoms last 3000 heats or about 2 years. Eleven tons are made an hour with the same equipment with which Americans make only 7 tons an hour, the higher output being due in part to charging immediately after tapping. The Germans make bottom only once a week instead of twice a day as in this country. Water cooling of furnace parts is used little in German practice. Walls of German furnaces are 30 inches thick at the bottom and 24 inches at the top as compared with 18 and 13½ respectively in American furnaces. Roofs are about the same as in our own construction. Suspended roofs have been tried but have not met with success.

—STEEL 1-22-31

Sand Reclamation

Means for controlling the consumption of sand in molding practice, discussed by M. D. Pugh in The Foundry, Jan. 15, p. 72, 2½ pp.

The amount of reclaimed sand used in facing mixtures in steel foundries is determined by the physical properties desired in the sand and by the method of molding. Less used sand can be employed in dry sand work than in green sand molding. The author defines conservation and reclamation and describes the methods and equipment used in carrying out these operations. Results of a series of tests designed to show the components and effect of fines in molding sands also are given. The greater the spread of grain size in sand, the lower the permeability.

—STEEL 1-22-31

Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

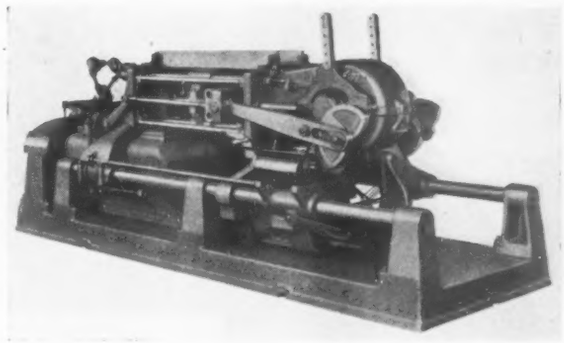
Die Casting Machine Makes Parts of Large Size

Madison-Kipp Corp., Madison, Wis., is marketing a large size die casting machine based on a design which has had several years of successful use in this company's own die casting plant. This machine, which is shown in the accompanying illustration, will handle such parts as typewriter frames.

The machine is built around a melting pot which is of sufficient size to provide a large amount of metal at each "shot," and to permit the frequent addition of fresh pig metal without serious cooling effect. Ten gas burners are used to heat this pot, these being arranged in groups of five on a side. Waste heat is lead up through two hollow castings called "stoves" and is used to heat the gooseneck between the pot and the die. Heat is retained by 6-inch insulation.

Provisions are made for full automatic operation. The movable die carriage is backed up by heavy steel crosshead having bearings both for inside and outside support. Back of the camshaft which actuates the connecting rods of this mechanism there is a second pair of cams which advance and pull the cores, through a system of levers and bellcranks.

The machine has ample strength to stand the heavy duty to which it is subjected when making large castings. Adjustment is simplified by a flexible compressed air connection, and a safety device is provided which prevents the forcing of metal into the die should the machine accidently be started in the reverse direction. Another safety device prevents accidental tripping of the air valve. An automatic die locking device prevents the spurting of hot metal. Control is through a single lever which engages a clutch in the motor drive mechanism. A 3-horsepower, 4-speed constant-torque motor is used to drive the machine, and allows 2.77, 4.16, 5.55 and 8.33 "shots" per minute. Weight is 12,000 pounds.

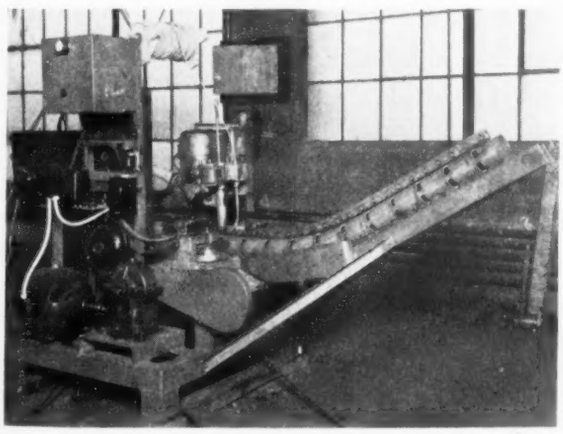


Automatic production of large size die castings is carried out at speeds ranging from approximately three to eight per minute on this cam-operated machine

◆

New Welder Automatically Fuses Starter Frames

Lincoln Electric Co., Cleveland, has announced a new automatic welder for automobile starter frames. This welder, shown in the accompanying illustration, uses no filler rod, the two edges of the seam being fused together. The starter and generator frame are usually of 5/16 or 3/8-inch plate, which is cut to size and shape, punched, and rolled into cylinders before being arc welded. After this operation, the cylinders are fed into a gravity conveyor, being guided automatically so as to keep the seams on top. At the bottom of the conveyor, they go between two rolls which squeeze the seams together as they pass under the arc. The machine has a capacity of approximately 240 frames per hour and one man and a helper can operate four machines simultaneously. The shielded arc utilized in this machine produces a weld of high tensile strength and good ductility, with a pleasing appearance.



Magazine feed and shielded arc makes possible the automatic welding of 240 automobile starter frames per hour per machine, and one operator and a helper can handle four units

◆

Locking Device for Jigs Gives Quick Action

Wedge-Lock Tool Co., 2523 North Keeler avenue, Chicago, has developed a locking or clamping device for use on drill jigs or, miling or assembly fixtures. The device, shown in the accompanying illustration, is designed primarily to save time, and operates on the principal of a wedge locked into place. It is composed of four parts, shell, plunger, spring, and operating screw. The shell is threaded with standard threads and can be placed in postion in the jig or fixture as quickly as a screw. The inside of the shell is hexagonal, to take the hexagon head of the plunger and to prevent its twisting.

The locking action, which is practically instantaneous, is absolutely positive. It has more gripping power

These PROTECTED MOTORS

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HELP KEEP . . . PRODUCTION MOVING

Plant Engineers and Production Men have a common interest in this improved type of Reliance Motor. Primarily designed to lessen inspection, and maintenance it brings another and still greater advantage . . . . it sticks to the job longer and saves interruptions in the production line. The reason why, you can readily see. The vital parts are sealed against dirt, oil, fumes and moisture . . . trouble-makers in the best-made motor. The windings stay clean and dry. Nothing can get in to clog the air gap between rotor and stator.

Push-button Control

Enclosed Fan-cooled Reliance Motors in sizes 7½-30 hp. are the across-the-line type. Simple low-cost starters can be used. These are step savers.

No Larger than Open Motors

The method of cooling used by Reliance is so effective that these enclosed motors in most sizes up to 150 hp. are interchangeable in mounting dimensions with open motors of the same horse-power, and speed rating. This type of motor makes it possible to obtain the advantages of a dust-tight construction at a reasonable cost.

Get details from Bulletin 107

RELIANCE ELECTRIC & ENGINEERING CO.

1082 Ivanhoe Road **Cleveland, Ohio**

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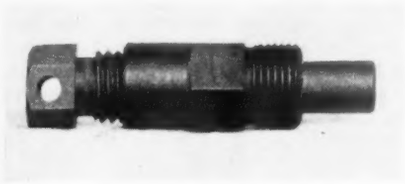
Representatives: Denver, Kansas City, Mo., Knoxville, Los Angeles, Seattle, San Francisco.

RELIANCE A-C D-C MOTORS with Ball Bearings



Quick locking of jigs and fixtures is accomplished by this device

than a screw, but, unlike a screw, does not rotate, therefore the work does not move when locked. The plunger will not mar the work. One eighth turn of the operating screw causes the plunger to advance from ⅛ to 3/16 inch. When turned in the opposite direction the plunger retreats from the work the same amount, the movement being automatic. This provides ⅛ to 3/16 inches for loading or unloading.

◆

Electric Drills Operate in Close Quarters

Chicago Pneumatic Tool Co., 6 East Forty fourth street, New York, has brought out two electric drills designed for use in airplane, automobile body trim departments, and on metal furniture, steel shelving, and sheet steel filing cabinet work. They are furnished with either snap contact or trigger switch control and are especially suited for work in tight corners, as the two models are only 11⅜ and 9¾ inches in length.

They have a drilling capacity up to 3/16 inches and are designed for high-speed work. Self-contained commutator and simplified stator control permit rough usage without damaging the drill. Gears are chrome-nickel steel, heat treated and hardened.

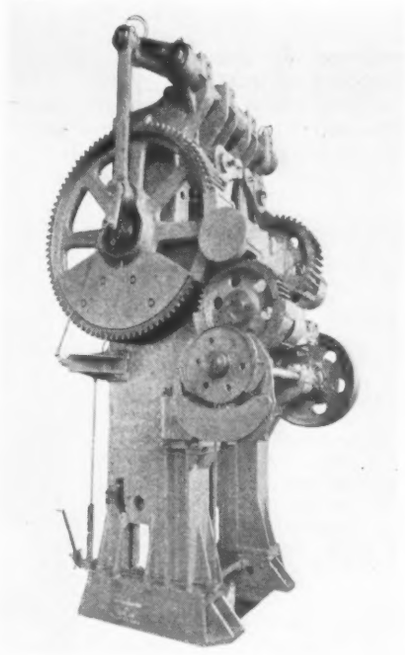
◆

Drawing and Stamping Press Weighs 225 Tons

Toledo Machine & Tool Co., Toledo, O., recently put on the market a single-crank double-action toggle press of unusually large size. This press, which was designed primarily for drawing and deep stamping, is shown in the accompanying illustration. A number of unique design features are embodied, including location of the toggle mechanism in the crown, thus giving compactness with strength. This toggle mechanism, which operates and controls the dwell of the blank-holder slide, has all operating parts of steel castings, bronze bushed.

Exact control is assured by a special multiple-disk friction clutch with independent brake. This clutch mechanism is arranged so that the press either can be operated continuously, stopped at any part of its stroke, or by changing the position of a stud it can be made to stop automatically at the top center. Stroke of the plunger slide is 45 inches, with an adjustment of 10 inches by a power elevator driven by a 10-horsepower reversible motor running at 1200 revolutions per minute.

The size and power of the press is indicated by the following specifications: Overall height, 35 feet 2 inches; distance between uprights, 5 feet 9 inches; plunger, 4 feet 2 inches front to back and 3 feet 6 inches right to left; blank holder 5 feet 8 inches front to back and 4 feet 9 inches right to left; top of bed, 5 feet 8 inches square; and maximum die space is 6 feet 8 inches. The flywheel is 6 feet in diameter and weighs 11,000 pounds, the total weight of the machine is 450,000 pounds, and a 200-horsepower motor is required to drive it. The press is triple-geared in the ratio of 80 to 1 and makes 3⅞ strokes per minute. It is capable of drawing a ⅛-inch stainless steel shell 24 inches square by 24 inches deep.

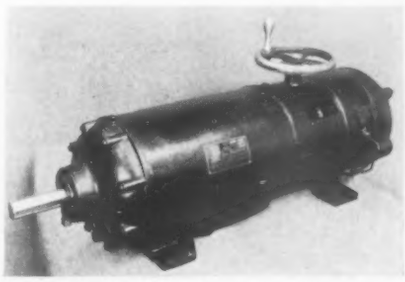


Compactness and strength are attained by toggle mechanism in crown

◆

Variable Speed Drive Is Unusually Efficient

Stephens-Adamson Mfg. Co., Aurora, Ill., is manufacturing a unique variable-speed drive, which combines motor, speed changer, speed reducer and control in a single housing. The new drive, shown in the accompanying illustration, is compact, easily mounted, quiet and the maker claims it to be unusually efficient because of the elimination of bearings, couplings and at least two sets of gear reductions. It is made in sizes to deliver from ¼ to 7½ horsepower for driving feeders, assembly conveyors, machine tools, and for other applications where a variable-speed drive is needed.



Speed reduction and control functions are centered in single unit

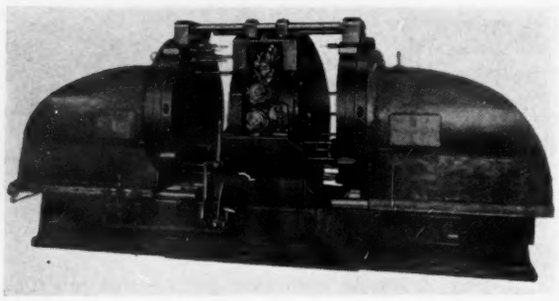
The motor section ordinarily is wound to operate at 1200 revolutions per minute and the drive will deliver the power at any speed between 24 to 144 or 120 to 720 revolutions per minute. The output speed may be increased or decreased while the machine is in motion. The whole mechanism is enclosed in a single housing, and no moving parts, except the output shaft, are exposed. This protects both machine and operators from possible injury. The unit can be mounted in any position by means of four bolts.

◆

Multiple Drilling Machine Speeds Production

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, recently has designed a machine for drilling 13 holes in the periphery of forged steel parts. This machine incorporates a base and slides built by W. F. & John Barnes Co., Rockford, Ill. As is indicated by the accompanying illustration, the holes drilled by this machine are unevenly distributed. They also vary in depth and size, and some of them require more than one operation.

The trunnion type work-holding fixture is mounted on the bed at the center of the machine, and facing it on either side are the multiple drill heads. The forging is clamped in the fixture by means of a span-



Combination of indexing and revolving fixture with two multiple tool heads, speeds up drilling and counterboring of forged parts

ner-operated equalizing toggle, being located at three points for accuracy. Owing to irregular spacing of holes several extra stations are required.

While the fixture is being indexed 22 degrees, the part itself is rotated 12 degrees on its axis, this being accomplished by means of a pinion on the fixture and a stationary ring gear on the bushing plate. A hardened and ground guide bar interlocking the stationary bushing plate and rotating fixture insures alignment of fixture and drills. This guide bar enters hardened and ground bushings both in the bushing plate and fixture. In addition, there is a separate guide bar for each working station. The fixture is indexed by a crank-operated form and worm wheel mechanism.

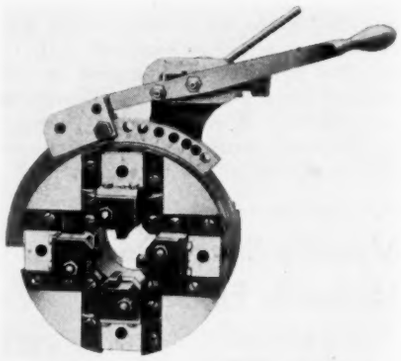
The two full ball bearing multiple heads are mounted on the faces of two-way hydraulically-operated slides and have individual direct motor drives. Hand control for starting and stopping the feed is located at a convenient position at the front of the machine. This is supplemented by an emergency foot stop. No time is lost in loading, this being done in a loading station while other parts are being drilled and counterbored in the operating positions. The diameters of the holes drilled vary from 3/16 to 9/16 inches, five of them being counterbored. The size of the machine is indicated by the fact that the heads are about 6 feet in diameter.

◆

Opening Die Head Insures Accurate Pipe Threads

Bignall & Keeler Machine Works, Edwardsville, Ill., has designed a threading die-head in the operation of which one upward movement of the die lever lifts all the chasers clear of the pipe and coupling. The positive lock on the screw adjustment of the head, shown in the accompanying illustration, insures accurate duplication of threads once the proper adjustment is made.

High speed steel chasers with curved eccentric relief, which reduces friction to a minimum, allow high cutting speeds. These chasers have the cutting edge well ahead of the center line. The die block is made in two sections; the upper section which holds the chasers, is provided with screw adjustment for in-



One upward movement of die lever clears all chasers from work

creasing or reducing clearance on each chaser. Slides have exceptionally long travel, allowing one set of chasers to cut all diameters within the capacity of the head, so long as the taper and thread remain the same. Another feature is the fact that one die can be replaced without renewing the whole set. This die head is suitable for use on any heavy power driven threading machine.

◆

Butt Welder Accommodates Many Types of Work

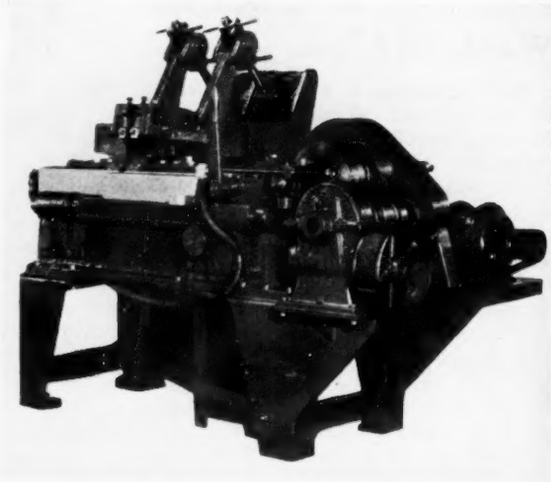
Thomson-Gibb Electric Welding Co., Bay, City, Mich., has introduced a universal, power-driven butt welder which is suitable for the butt welding of certain classes of rims or for the welding of comparatively wide thin sections of strip stock, or condensed sections within the capacity of the machine. This welder, which is shown in the accompanying illustration, is equipped with universal-type, air-operated, open end clamps. Special clamps and platens can be applied for special work.

The air-operated clamps function through toggle links, to permit wide adjustment of jaw opening to take care of a great variety of shapes of work. Dies and jaws will take stock up to 7-inch width and jaws are so mounted that they may be removed and replaced when necessary. The power drive unit consists of a 2-horsepower motor connected by belt to a gear reduction unit which in turn operates a clutch shaft, geared to the shaft carrying the main push-up pressure cam. This pressure cam is of large diameter and has an unusually wide face.

◆

Speed Change Units Employ Variable Pitch Chain

Link-Belt Co., Philadelphia, has put on the market a line of all-metal



This power-driven butt welder, with air-operated open end clamps, handles strip stock sections up to 7 inches wide and makes fast work of rim welding and similar jobs

SERVING INDUSTRY

A skyscraper shoots its skeleton of steel into the sky. The staccato taps of air hammers drive home rivet after rivet—Upson rivets.

After searching for days for a bolt to answer a special need on a newly designed planer the specifications are made to read—Upson.

And so it goes—industry after industry turns to Upson for its requirements in bolts, nuts, turnbuckles, and similar products.

Remember, your specialties are our specialty. Standard items stocked by supply houses everywhere.

UPSON NUT DIVISION—CLEVELAND, OHIO

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

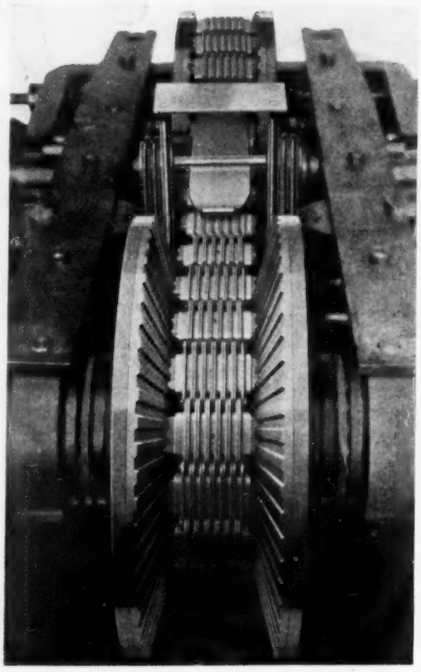
speed changing transmission units which give infinite speed variations between their upper and lower limits, and at the same time insure positive drive at all speed ratios. The accompanying illustration, which is an end view showing the variable wheels and drive chain, indicates the principles upon which the mechanism operates.

Basically, a unit consists of two pairs of wheels of the opposed conical disk type, between which runs a chain of unusual design. By means of pivoted levers, one pair of wheels is drawn apart as the other pair is pressed together, causing the variable pitch chain to rise on one set as it descends on the other. This can be carried out smoothly under power, allowing the output shaft to be brought to the desired number of revolutions per minute while the imput shaft continues to revolve at constant speed.

Chain Drive Employed

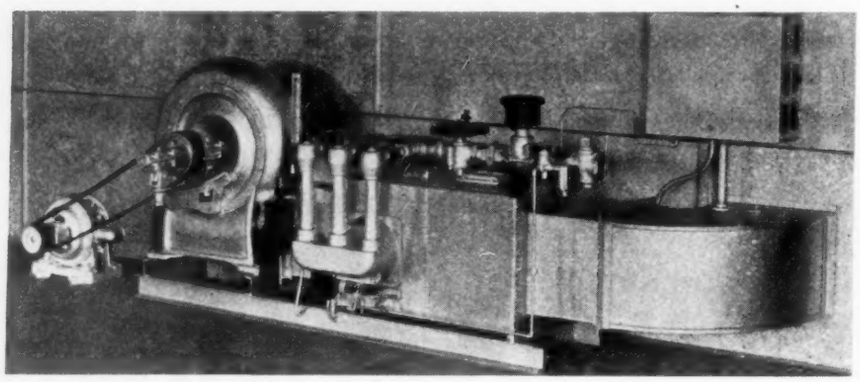
While variable-speed devices employing adjustable conical disks with Vee belts driven by side friction have been used for a long time, this new device departs from conventional practice in that positive chain drive is employed. This is accomplished by cutting radial slots in the driving faces of the wheels, these slots being of uniform depth but of increasing width from center to circumference. Facing wheels are set so that the slots of one come opposite the teeth of the other.

The chain is made up of a series of flat steel links with joints consisting of hardened steel pins turning in segmental bushings. The teeth of this chain are made up of packs of hardened sheet steel slats which are inserted into containers held in slots in the links, at right angles to them, the slats projecting about ⅛ inch at each side of the chain. The containers are fastened securely into the link slots, but the slats are free to slide from side to side individually, thereby causing them to adjust themselves to engagement with teeth and slots in the wheels throughout the range of setting. The ends of the slats have 30 degree angles, corresponding to the face angles of the opposed conical disk wheels.



Self-pitching chain is feature of positive variable-speed drive

The entire unit is enclosed in an oil tight housing and is splash lubricated. The wheels are of cast iron with hardened steel faces and are backed up by ball thrust bearings. Speed control is by means of a hand wheel which operates the levers by a right and left-hand screw mechanism, and a speed indicator is provided. The units are built in five sizes ranging from 1 to 10-horsepower capacity. They give speed change ratios up to a maximum of 6 to 1.



Gas-fired oven heater operates on principle of push through or pull through recirculation of diluted products of combustion

Heating Unit for Ovens Is Externally Located

Drying Systems Inc., 1800 Foster avenue, Chicago, has introduced a new type gas-fired heater to its line of gas and oil-fired external heating equipment. The equipment is designed for heating industrial ovens, dryers, bake ovens, etc.

The new unit is designed on the principles covering the recirculation of diluted combustion products and may be operated either as a push through or pull through type heater. When operated as the former type, the circulating fan is located at the inlet end of the heater where it handles either cold air or, if the recirculation principle is used, air of considerably lower temperatures than the heated mixture delivered to the oven. The cooler air passes through the heater at high velocity and induces and dilutes the combustion products from the gas burners for delivery to the oven at the desired temperature.

When the unit is operated as the pull through type, the fan is located at the outlet end of the heaters so that the products of combustion which consist of fresh air and recirculated air are pulled through the heater and fan for delivery to the oven at the desired temperature. Several type burners are available. The simplest burner is of the atmospheric type and the burner front is designed to accommodate that type. High or low pressure inspirator type burners may be installed by making minor changes.

◆

New Magnetic Switch Has Latch for Contactor

General Electric Co., Schenectady, N. Y., has developed a magnetic switch for use on either alternating or direct-current circuits. This switch is provided with a latch which holds the contactor closed. Such a condition is particularly desirable where the hum of a standard magnetic switch must be eliminated; where the power consumed to hold the contactor closed by the usual method must be eliminated because of cost; or where the switch must not open in case of coil failure, power failure or short circuit.

The device consists of a two or three-pole, alternating-current contactor with a latching mechanism, mounted on a base and with or without an enclosing case. The contactor is standard except for an extension to the shaft to which the latching mechanism is attached.

Sentiment Better Than Business

Further Gains Made In Steel Output and Orders, but Less than Expected — Building, Railroads, Pipe Lines Chief Market Support—Prices Steady

STEELWORKS operations have increased for the fourth consecutive week, now being 46-47 per cent, and bookings in the past week exceeded shipments. This improvement, however, is tempered by a more uneven distribution of demand, and there are indications that sentiment has over-run actual progress.

Minus the impetus derived from releases of material suspended before the holidays, the steel markets have settled down to the basis of absolute current requirements. Most consumers of steel have yet to see their own products moving faster, though no less confident this nears, and thus have had no occasion to re-order.

As a result, market activity is supplied chiefly by continued heavy awards of building steel, the cleanup of track material requirements of the railroads, and several large domestic pipe contracts. Inevitably the situation is spotty, and since sentiment is not entered on mill order books, the contrast between expectation and reality is more marked.

The slower rate of gain both in production and bookings has not disturbed the underlying belief that the worst is past, nor has it appreciably affected prices. Most users having covered prior to the advance for this quarter, price is a minor factor now. Vigorous buying, however, is always a support for prices and the abstinence of buyers sometimes is harmful.

Structural steel awards this week, at 31,592 tons, exceed both the 27,383 tons of last week and 30,020 tons of a year ago. For 1931 to date structural orders have totaled 114,741 tons; for 1930, 89,267 tons. The most noteworthy letting was 15,000 tons for an elevated highway in New York, with 20,000 tons for this project active and 10,000 tons still to come out.

New rail business includes 35,100 tons for the Southern, with the Rock Island and Illinois Central prospective buyers of 60,000 tons, the St. Paul of 35,000 tons, and the Nickel Plate of 18,000 tons. Bids are in on New York Central and Pennsylvania track fastenings which, with other inquiry, aggregate 35,000 tons.

An export inquiry for steel pipe, noted last week as 40,000 to 50,000 tons, now assumes the proportions of 160,000 to 180,000 tons, being for a line from Bagdad to a Mediterranean port. Since foreign as well as American oil companies will participate, European competition may be keen. National Tube Co. will roll at Lorain and Gary most of the 80,000 tons of pipe it has booked for the Continental Construction Co. The Columbia Gas & Electric Co. award of 30,000 tons of pipe to Youngstown Sheet & Tube Co. does not entirely cover its requirements.

Specifications for strip are slightly improved at Pittsburgh. Only at Chicago, where jobbers are more active, is a gain reported in wire products. Sheet makers at Pittsburgh are moderately encouraged by automotive specifications, but the situation is not yet clarified. Bars are slow in all districts, owing to the automotive lethargy. Plate prices appear somewhat firmer in the East than in the Middle West. Tin plate production is now up to 60 per cent.

January shipments of pig iron in most districts show an increase over December. Some melters who have not covered are buying spot lots in preference to contracting. Coke is dull, even for heating purposes. The scrap market is more uncertain, there being more price declines than advances this week, but few of each.

By districts, steelmaking operations are off 2 points this week at Cleveland, to 48 per cent, and unchanged at Pittsburgh at 45 per cent. In all other districts slight gains have been registered, with Birmingham now at 60 per cent, Youngstown 48, Chicago 40-45, Buffalo 45 and eastern Pennsylvania 47-48.

Following last week's rise, the first in six months, STEEL's market composite is unchanged at $31.73.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Jan. 21, 1931)	**$31.73**
Last week (Jan. 14, 1931)	**31.73**
One month ago (December, 1930)	**31.74**
Three months ago (October, 1930)	**32.26**
One year ago (January, 1930)	**35.56**
Ten years ago (January, 1921)	**51.98**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Jan. 21, 1931	Dec. 1930	Oct. 1930	Jan. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.76	18.76	19.36	20.76
Basic, valley	17.00	17.00	17.00	18.50
Basic, eastern del. eastern Pa.	17.50	17.50	17.50	19.20
No. 2 foundry, del. Pittsburgh	18.26	18.26	18.46	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.70
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	18.26	18.26	19.26	21.56
Malleable, valley	17.50	17.50	17.80	19.00
Malleable, Chicago	17.50	17.00	17.50	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.63	17.63	17.83	19.13
Ferromanganese, del. Pittsburgh	89.79	93.29	103.79	104.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.60	2.55
Connellsville foundry, ovens,	3.25	3.50	3.50	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	30.00	30.50	31.00	33.80
Sheet bars, open-hearth, Pitts.	30.00	30.50	31.00	33.80
Billets, open-hearth, Pittsburgh	30.00	30.50	31.00	33.80
Wire rods, Pittsburgh	35.00	35.50	36.00	40.00

	Jan. 21, 1931	1930 Dec.	1930 Oct.	1930 Jan.
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.60	1.60	1.90
Steel bars, Chicago	1.70	1.70	1.70	2.00
Steel bars, Philadelphia	1.94	1.89	1.89	2.17
Iron bars, Chicago	1.70	1.70	1.75	2.00
Shapes, Pittsburgh	1.60	1.60	1.60	1.90
Shapes, Philadelphia	1.81	1.76	1.76	1.91
Shapes, Chicago	1.70	1.70	1.70	2.00
Tank plates, Pittsburgh	1.65	1.60	1.60	1.90
Tank plates, Philadelphia	1.80½	1.80½	1.80½	2.05
Tank plates, Chicago	1.70	1.70	1.70	2.00
Sheets, blue anl., No. 13, Pitts.	2.05	2.05	2.15	2.30
Sheets, black, No. 24, Pitts.	2.35	2.35	2.40	2.70
Sheets, gal., No. 24, Pittsburgh	2.90	2.90	3.00	3.35
Sheets, black, No. 24, Chicago	2.50	2.50	2.60	2.90
Sheets, blue anl., No. 13, Chicago	2.20	2.30	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.05	3.15	3.20	3.55
Plain wire, Pittsburgh	2.20	2.25	2.30	2.40
Wire nails, Pittsburgh	1.90	1.90	2.00	2.35
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	13.00	12.75	14.80	16.55
Heavy melting steel, eastern Pa.	10.50	11.00	12.00	14.50
Heavy melting steel, Chicago	10.00	10.00	11.55	12.65
No. 1 wrought, eastern Pa.	13.00	13.50	14.25	15.25
No. 1 wrought, Chicago	9.50	10.00	10.95	13.40
Rails for rolling, Chicago	13.00	13.00	14.10	14.65

Sheets

Market Reflects Better Outlook in Some Districts, Slow in Others—Prices Continue Steady

SHEET PRICES, PAGE 63

Pittsburgh—Sheet specifications hold at about the rate of the past few weeks. Producers have placed additional business on books but specifications are slow to appear. The improved outlook in the automotive industry gives some encouragement to sheet producers, and some additional orders for automotive sheets have been received. Shipments are heavier than a month ago, but the upturn has been gradual and to a certain extent disappointing. Prices are firm at current levels, with few reports of shading. The market usually is 2.35c, Pittsburgh, for black sheets, 2.90c to 3.00c for galvanized, 2.05c for No. 13 gage blue annealed, 1.90c for blue annealed plates, and 3.30c for autobody.

New York — Galvanized sheets have been strengthened by a tendency to eliminate the 2.90c, Pittsburgh, price, which now applies to jobbers and certain other preferred customers. Meanwhile, this price still rules on this class of business, with 3.00c, Pittsburgh, quoted on the general run of orders for direct fabrication. Black sheets are firm at 2.35c, Pittsburgh; No. 10 blue annealed are 1.90c; and No. 13 blue annealed, 2.05c.

Philadelphia — Sheet business shows further slight gain, with a better feeling among consumers. Mills look forward to increasing specifications. Prices appear firm.

Youngstown, O.—From specifications for autobody sheets this week in preparation for February rollings mill managers are not clear as to trade prospects for the coming month. They hope this uncertainty will be removed in the right direction by the end of the week. Orders for common grades of sheets are of a routine character. The Republic Steel Corp. is said to be planning to store its galvanizing equipment at its Deforest mills at Niles, O., and concentrate its sheet galvanizing activity at its Canton, O., works. The Western Reserve blue annealed mills of Youngstown Sheet & Tube at Warren, O., still are idle. Common black sheets are held at 2.35c, Pittsburgh, with blue annealed at 1.90c and 2.05c, while galvanized range from 2.90c to 3.00c, and autobody are 3.30c.

Cleveland—Signs of improvement are present in the sheet market. Releases continue from Ford and Chevrolet and a few other automotive interests. Fisher Body is on a 16,000-body per week basis and orders accordingly. An electric refrigerator manufacturer bought about 2000 tons of enameling stock. Barrel manufacturers ordered a fair amount of black sheets at 2.35c, Pittsburgh. Small lots of galvanized are moved at 2.90c and 3.00c. Specifications from makers of materials used in building construction are good. Autobody sheets are 3.30c and metal furniture, 3.60c, Pittsburgh. Several hundred tons of sheets for Higbee Co. department store went to a valley mill instead of a Pittsburgh mill as previously reported.

Chicago—Sheet orders have failed to gain largely because of the slow movement from jobbers' stocks. A sprinkling of light manufacturing orders for blue annealed sheets are noted. Mill prices for No. 24 black are 2.45c to 2.55c, while No. 24 galvanized are on the basis of 3.05c, mills to carload buyers.

Cincinnati — Continued improvement in demand is reported by sheet mills here, specifications covering general lines as well as automotive.

Birmingham, Ala.—Makers report demand for sheets is better than in December. Work is progressing on the Tennessee Coal, Iron & Railroad Co.'s new mill at Fairfield, Ala., with the new 150-ton open-hearth furnace nearing completion.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.35c
Philadelphia, delivered	2.64c
Gary, Indiana Harbor	2.45c
Chicago, delivered	2.50c
Birmingham, base	2.50c to 2.60c
St. Louis, del.	2.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.65c to 2.75c
Gary, base	2.75c to 2.85c

GALVANIZED NO. 24

Pittsburgh, base	2.90c to 3.00c
Philadelphia, delivered	3.19c
Chicago, delivered	3.05c to 3.15c
Gary, Indiana Harbor	3.00c to 3.10c
Birmingham, base	3.05c to 3.15c
St. Louis, del.	3.35½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.05c
Chicago, district mills	2.15c to 2.25c
Chicago, delivered	2.20c to 2.30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.34c
Birmingham	2.20c to 2.25c

BLUE ANNEALED SHEETS NO. 9-10

Pittsburgh, base	1.90c
Chicago, district mills	2.00c to 2.10c
Chicago, delivered	2.05c to 2.15c
Philadelphia, delivered	2.19c
St. Louis, delivered	2.35½c
Birmingham	2.05c to 2.10c

AUTOMOBILE NO. 20

Pittsburgh, base	3.30c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.60c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	5.00c
Gary, Ind., base 10 cents higher.	
Long ternes, 24, assorted	3.55c
Long ternes, 24, unassorted	3.45c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.05c and 2.15c
Galvanized wire	2.50c and 2.60c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c to 2.30c
Spring wire	3.20c
Wire, delivered Detroit	2.50c
Nails, delivered Detroit	$2.35

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.80½c to 1.85½c
New York, del.	1.93c
Boston, del.	2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.10c to 2.20c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.81c
New York, del.	1.85½c to 1.90½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.15c to 2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coasts, c.i.f.	2.25c
Cleveland, base	1.65c to 1.70c
Philadelphia, del.	1.94c
New York, delivered	1.98c
Boston, delivered	2.05c
Pittsburgh, cold finish	1.75c to 1.80c
Pittsburgh, forg. qual.	1.85c to 1.90c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.70c to 1.75c
New York, delivered	1.98c to 2.08c
Philadelphia, delivered	1.94c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet	1.70c to 1.80c
Chi., rail steel	1.50c to 1.60c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold-Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.20	Cr., Ni., Van.	1.50
4100 .15 to .25		Carbon Van.	0.95
Mo.	0.50	9250 (flats)	0.25
4600 .20 to .30 Mo.		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.65c to 1.70c
Hot strip 6 1/16 to 24-in. Pitts.	1.55c to 1.60c
Hot strip, bands 6 in. and under, Chicago	1.75c to 1.80c
Do. 6 1/16 to 24 in.	1.65c to 1.70c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.25c to 2.35c
Worcester, 3 tons, over	2.50c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$46.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off

Upset 1 in. and smaller ..... 80-10-5 off

Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh	2.40c
do, less carloads, 5 kegs or over, 2.65c; and less than 5 kegs, 2.80c.	
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Dull Demand Remains Below Expected Level—Price Holds Fairly Well—Iron Bars Shaded

BAR PRICES, PAGE 63

Chicago—Bar specification gains are slow. Orders from excavating, road machinery and shovel makers are better than from automotive or implement builders. Holdover business for specific work at 1.70c, Chicago, predominates, while mills obtain 1.75c only for mixed carload spot orders from smaller buyers. Forgers and parts makers are cautious about committing themselves owing to expected dragging first quarter automotive releases. Bar business is 20 to 25 per cent under January, 1930. Bar mill operations are 35 to 40 per cent, and alloy mills are above 40.

New York—Steel bar sellers generally are quoting 1.65c, Pittsburgh, on all new business. Demand is showing more life. Common iron bars are 1.65c to 1.75c, Pittsburgh, with shading of $1 on carload business.

Philadelphia — Specifications for steel bars are maintained at the recently improved level, with the price on new business firm at 1.65c, Pittsburgh.

Pittsburgh — Little further increase is noted in specifications for steel bars, although demand is definitely improved over the poor December activity, both in number of orders and tonnage. Little business is appearing in the open market but producers are quoting 1.65c on inquiries. Automotive business continues to improve mildly but remains below expectations.

Youngstown, O.—A slight gain in specifications for steel bars has brought some relief to local bar mills. Shipments this month are expected to show some gain over December, due to specifications received by makers since closing of December inventory by consumers. However, with agricultural implement makers and the railroads still pursuing a conservative buying policy, and with automotive builders continuing to do likewise except for some grades of alloy steel bars, mill managers here are only conservatively cheerful over the immediate outlook. Steel bars hold firmly here at 1.65c, Pittsburgh, for all deliveries.

Cleveland—New orders, while under the corresponding period in 1930, show betterment in volume this week. One seller reports interest by customers from whom inquiry has been lacking for some weeks. Local mills, while announcing 1.70c, have placed less than carload commitments at 1.65c, local base, which has been done on both local and outside delivery. Leading sellers here, however, claim they will not go lower than 1.65c, Pittsburgh, and 1.70c, Cleveland. A mill adjacent to the Pittsburgh district has been vigorously quoting on all possible work lately at 1.65c, Cleveland base, on hot-rolled bars and in the Akron and Canton districts.

Cold-Finished Bar Sales Show More Diversification

Cold Finished Prices, Page 63

Pittsburgh — Specifications for cold-finished steel bars and shafting are coming from a more diversified list of buyers despite little improvement in total commitments. Buying by farm implement and textile machinery manufacturers is more active even though in small lots. Automotive requirements remain seasonally light and show little increase over demand of recent weeks. The market is steady at 2.10c, Pittsburgh, on what orders not covered by contract are appearing.

Semifinished Orders Small; Skelp More Active

Semifinished Prices, Page 76

Pittsburgh — Shipments of semifinished steel continue light and new business has been productive of only small lots. Occasional orders for a few hundred tons at a time are being received with the market steady at $30 for rerolling billets, slabs and sheet bars. Producers of forging billets continue to quote $36, with wire rods $35.

Youngstown, O.—Rather indefinite operating schedules of sheet and strip mills in this district this week have tempered optimism in revival of the market for sheet bars and billets, with 25 open-hearth mills active out of 52, or 48 per cent, although wire rods and skelp continue in fair demand. The latter is due to further orders for electrically welded gas line pipe received by one valley maker. Billets, sheet bars and slabs continue to bring $30, Youngstown and Pittsburgh.

Plates

Market Quieter, Oil and Railroad Work Lacking—Most Releases Against 1.60c Contracts

PLATE PRICES, PAGE 63

Chicago—Plate mills have dropped to below 40 per cent, as one producer probably will be down all week. Some shipments may be made from this district against the 80,000-ton National Tube Co. pipe line order, but deliveries of pipe line skelp to Milwaukee will be completed in the next ten days on pending orders. Southern Fuel Co. has been formed jointly by the Southern California Edison Co., and Southern California Gas Co., to build natural gas pipe lines from the San Joaquin valley fields to Los Angeles, costing $7,000,000. Base price for plates now is 1.70c, Chicago.

Eight to ten thousand tons of plates for storage tanks are becoming active.

Philadelphia — Sales are larger and makers see the prospect of further improvement in the next two weeks. Prices are firmer than in a long time, at 1.70c to 1.75c, base, Coatesville, Pa. Certain buyers who refused to contract for the first quarter in December because of the higher prices then quoted have contracted recently at the prevailing level.

New York—The 1.75c, Coatesville, Pa., price continues firm on current plate business. General demand is improving slowly but reflects the almost total lack of car and locomotive business.

Pittsburgh—Plate business shows little additional improvement. Recent barge awards will require a fair amount although new inquiry for river equipment is light, involving about 650 tons for government work. The market continues 1.65c, Pittsburgh, on new business, although most specifications are against 1.60c contracts.

Cleveland—New orders are scarce and small in volume. The 1.65c, base, Pittsburgh, price prevails. Plate

fabricators in the Youngstown, O., district are said to receive price concessions on a Youngstown base from producers in that district. Lima Locomotive Works is reported to have placed firebox plates on the recent New York Central locomotive order with Otis Steel Co. Reports place 600 to 700 tons of plates in proposed Standard Oil of Ohio gasoline tanks for local erection.

Contracts Placed

640 tons, 51-inch welded steel pipe for Los Angeles, to Western Pipe & Steel Co., Los Angeles.

350 tons, two barges, Gulf Refining Co., Pittsburgh, to McClintic-Marshall Co., Pittsburgh.

200 tons, two welded barges, awarded through Ira S. Bushy & Sons, Brooklyn, N. Y., to Lukens Steel Co.

175 tons, Ross Island water main project, Portland, Oreg., to Beall Tank & Pipe Co., Portland, Oreg.

150 tons, three 2000-barrel oil tanks for port of Seattle, to unstated fabricator, erection by day labor, employed by city.

Contracts Pending

350 tons, dredge hull, for United States engineers, Memphis district.

300 tons, 22 pontoons for United States engineers, St. Louis district.

200 tons, lock for Big Kanawha river, Marmet, W. Va., for United States engineers, Huntington district; bids open Feb. 6.

Manganese Ore Arriving from South Africa

New York—The first shipment of South African manganese ore into this country was scheduled to arrive at Baltimore Jan. 20. The market on this ore, 52-53 per cent, is 24 to 26 cents per unit, not including duty, Atlantic seaboard. This range is 2 cents under that being quoted on Caucasian manganese ore, 52-55 per cent.

Indian manganese ore is nominal, no tonnage being reported purchased in this country. Prices here have reached the point, it is said, where it is difficult for Indian producers to sell and make a profit. Based on offerings now being made in England, it appears that around 26½ cents per unit is the lowest that Indian producers would be willing to go on shipments here. Brazilian manganese ore, 46 to 48 per cent, is nominally around 23 cents.

While Swedish low phosphorus continues to be offered at 10c, per unit, alongside docks at Atlantic ports, North African low phosphorus has been reduced 1 cent to 9c, per unit. Foreign manganiferous ore, 45 to 55 per cent iron and 6 to 10 per cent manganese, also is off 1 cent, now holding at 10c.

Railroads

Accessories Active—Cars Dull —Small Road Rail Purchases Expected Soon—Engines Quiet

TRACK MATERIAL PRICES, PAGE 63

Chicago—St. Paul railroad may inquire shortly for 35,000 to 40,000 tons of rails. It is indicated also that Rock Island and Illinois Central will be out shortly for a total of about 60,000 tons. Track fastenings inquiry, including the Pennsylvania and New York Central, totals more than 35,000 tons. About 2000 tons has just been ordered. Rail mills are 50 to 55 per cent.

Chicago & Illinois Midland expected shortly to close on about 200 freight cars. Its original inquiry involved 800.

New York—Dullness continues to characterize the local car market. Locomotive demand is slack. New York Central opened bids Jan. 21 on tie plates, track bolts, splice bars and spikes. This inquiry calls for 20,000 kegs of spikes and about 12,000 tons of tie plates, but considerably more may be purchased. Bids are in on tie plates for the Erie but no contract has been placed. New York, New Haven & Hartford awarded 2000 kegs of spikes to W. Ames & Co., Jersey City, N. J., which also booked a quantity of spikes for the Central Railroad of New Jersey.

Philadelphia — Pennsylvania railroad opened bids Jan. 20 on 55,000 angle bars, 300,000 tie plates and 1,500,000 pounds of spikes.

Pittsburgh — Specifications from railroads continue to improve gradually, although little new business was noted last week. Track material still is pending for several roads. Pere Marquette closed with several producers on tie plates. Rail mill operations gradually improve.

Cleveland—Feb. 1 is the scheduled date for the appearance of the rail and accessory inquiry of the Nickel Plate. It is expected to ask for 60 per cent of the tonnage it took last year, placing 40 per cent under option. It arranged for 24,000 tons last year but took out 18,500 tons. Several other small roads are expected to buy rails as soon as the merger of four large systems is completed. The new setup is expected to inspire additional rail buying also by some of the lines directly involved.

Birmingham, Ala.—Recent contracts booked by Ensley mills of Tennessee Coal, Iron & Railroad Co. included 20,000 tons of rails and 1000 tons of track fastenings and other accessories for Southern Pacific and 30,655 tons of rails for Southern railway. The backlog thus is materially increased.

Car Orders Placed

Indiana Service Corp., Indianapolis and Louisville, Ky., 35 electric railway coaches, 14 to American Car & Foundry Co., Jeffersonville, Ind., and 21 to Pullman Car & Mfg. Corp., Pullman, Ill.

Rail Orders Placed

Canadian National, 34,000 tons 130-pound rails, to Dominion Steel & Coal Corp. Ltd., Montreal.

Southern, 35,100 tons, including 30,655 tons to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and 4445 tons to Bethlehem Steel Co., Bethlehem, Pa.

Southern Pacific, 63,764 tons, divided equally among Columbia Steel Corp., San Francisco, subsidiary of United States Steel Corp.; Pacific Coast Steel Corp., San Francisco, subsidiary of Bethlehem Steel Co., and Colorado Fuel & Iron Co., Denver.

Car Orders Pending

Byllesby Engineering & Management Corp., Chicago, five 70-ton drop-bottom gondolas.

Chicago & Illinois Midland, 200 freight cars instead of 800 as originally asked.

General Electric Co., Schenectady, N. Y., one 150-ton transformer car.

Tin Plate More Active; Production Is Increased

Tin Plate Prices, Page 63

Pittsburgh—Tin plate specifications and operations show additional improvement. Orders are expanding as rapidly, if not more rapidly, than had been expected, and production is higher at around 60 per cent. January normally is a slow period and better activity is looked for during the coming several months. The market continues $5, Pittsburgh, per base box.

New York—With virtually all first half contracts concluded and with little or no export inquiry, the local tin plate market is quiet.

Destroyers Sold for Junk

Washington—Offer of the Boston Iron & Metal Co., of Baltimore, of $110,000 for the purchase of 19 destroyers out of commission at the Philadelphia navy yard has been accepted by the navy department.

Structural Shapes

15,000-Ton Elevated Road Placed in New York, 30,000 Tons More to Come—Lettings, Inquiries Increased—Milwaukee Has 12,000 Tons Pending—Prices Hold

STRUCTURAL SHAPE PRICES, PAGE 63

New York—Early action is now expected on approximately 20,000 tons for a part of the second section, West Side elevated highway. This is made possible by the recent favorable decision of the war department regarding extended pier head line in the Hudson river in the midtown section. Meanwhile James Stewart & Co. has been awarded the contract for the third section, Fifty-ninth to Seventy-second street, and 15,000 tons will go to the Fort Pitt Bridge Works Co. Lettings and fresh inquiry are slightly heavier. Prices on plain material are steadier and more general 1.885c, New York. Fabricated and erected prices, however, are still weak, failing to respond materially to firmer stand on plain material.

Erection of floor steel on the Kill van Kull bridge, said to be the largest steel arch span in the world, has been completed by American Bridge Co. for the Port of New York Authority. Bids have been taken for a section of the Bayonne, N. J., approach. Charles T. Kavanaugh, Bayonne, is low at $248,071.50 on the 1650-foot section between West Third and West Seventh streets, Bayonne. Spans over Juliette street are to be fabricated and erected by American Bridge Co.

The 250 tons of shapes for float bridges for Pennsylvania railroad, at Greenville yards, Jersey City, let to American Bridge Co. as noted last week, were delivered Jan. 9 to replace bridges destroyed by fire Jan. 4.

Boston—Structural interest is at low ebb. One unit of the Merrimac Chemical Co. plant at Everett, Mass., 140 tons, was awarded Boston Structural Steel Co. Bids on the general contract for Boston's post office closed Jan. 20.

Philadelphia—Shape mills in the East are operating 40 to 50 per cent of finishing capacity, with demand only fair. Prices continue firm with plain standard shapes on new orders carrying 1.75c, base, eastern mill. Wide flange thin web sections are 1.75c, Bethlehem. Pennsylvania railroad opened bids Jan. 20 on 55,000 angle bars.

Pittsburgh—Shape awards in this district are confined to small lots. Formal inquiries have not yet appeared for county bridge work or the local post office. Specifications for plain material are slow and unchanged in volume. Producers quote 1.65c, Pittsburgh, on new business but practically all shipments apply against 1.60c contracts.

Cleveland—About 6000 tons of structural material is immediately ahead of fabricators in this territory, although between 25,000 and 50,000 tons additional is involved in jobs in the projected stage. In the former group are: South high school, 550 tons: General Electric wire mill, 900 tons; Otis Steel continuous sheet mill, 1600 tons; May Co. addition, 1000 tons; West Fortieth street bridge, Big Four railroad 400 tons; two bridges for the city, 300 tons; two buildings at Cleveland for Standard Oil Co. of Ohio, 150 tons; and a few other small jobs. H. K. Ferguson Co. awarded 350 tons additional for Libbey Glass Co. buildings at Toledo, O. The Feilbach school at Toledo 150 tons, went to Whitehead & Kales Co., Detroit. While 1.65c, Pittsburgh, is the openly-quoted market figure, shipments still are being made by mills on 1.60c commitments.

Chicago—Structural orders totaled about 4000 tons, while approximately 5500 tons of inquiry is active. Prices are 1.70c to 1.75c, Chicago. About 12,000 tons also is becoming active in Milwaukee, including the Thirty-fifth street viaduct. Included in inquiry is 5000 tons for an ore dock at Marquette, Mich. Structural mills operate less than 30 per cent.

Birmingham, Ala.—The local shop of Ingalls Iron Works Co. will fabricate the 4000 tons of shapes for state capitol building, let to Lukens Steel Co. as noted in STEEL last week. This shop also is preparing to fabricate steel for ten barges for Inland Waterways Corp., already reported.

Worcester, Mass. — Structural shapes are quiet. A few small tonnages only are being let.

Awards Compared

	Tons
Awards this week	**31,592**
Awards last week	**27,383**
Awards two weeks ago	**41,131**
Awards this week in 1930	**30,020**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**28,685**
Av. weekly awards, Dec	**29,804**
Tot. awards to date, 1930	**89,267**
Tot. awards to date, 1931	**114,741**

Contracts Placed

15,000 tons, third section, west side elevated highway, Fifty-ninth to Seventy-second street, New York, to Fort Pitt Bridge Works Co., Pittsburgh; James Stewart & Co., New York, awarded general contract Jan. 16 by board of estimate on recommendation of New York Central railroad, co-operating with city of New York in construction.

4000 tons, state capitol building, New Orleans, let to Lukens Steel Co. as noted last week, to be fabricated by Ingalls Iron Works Co., Birmingham, Ala.; George A. Fuller Co., Washington, general contractor.

2500 tons, Pennsylvania avenue subway, Philadelphia, to Phoenix Bridge Co., Phoenixville, Pa.; F. A. Canuso & Co., Philadelphia, general contractor.

2300 tons, Ramsey tower, Oklahoma City, Okla., to American Bridge Co., Chicago.

2000 tons, bridge for Lac Du Bonnet, Man., to Dominion Bridge Co. Ltd., Winnipeg, Man.; M. Peterson is city clerk.

1000 tons, yeast plant, Old Bridge, N. J., Anheuser-Busch Co., St. Louis, to Lehigh Structural Steel Co., Allentown, Pa.; Stone & Webster Inc., New York, general contractor.

1000 tons, postoffice remodeling at Oklahoma City, Okla., to J. B. Klein Iron Foundry Co., Oklahoma City.

850 tons, Rutgers university, New Brunswick, N. J., to Ingalls Iron Works Co., Verona, Pa.; listed Jan. 1 as going to Arthur E. Smith Co., Plainfield, N. J., general contractor.

800 tons, power house alterations, Hudson avenue, Brooklyn, N. Y., for Brooklyn Edison Co., to Levering & Garrigues Co., New York.

800 tons, Steuben junior high school, Milwaukee, to Lakeside Bridge & Steel Co., Milwaukee.

787 tons, Feather river bridge, Pulga, Calif., to Moore Drydock Co., Oakland, Calif.

675 tons, Main street bridge, Weirton, W. Va., for Pennsylvania railroad, to Fort Pitt Bridge Works Co., Pittsburgh.

600 tons, Coast Guard academy, New London, Conn., to Ingalls Iron Works Co., Verona, Pa.

400 tons, Huron street bridge, Berlin, Wis., to Worden-Allen Co., Milwaukee.

400 tons, Northeastern high school, Baltimore, to Dietrich Bros., Baltimore.

375 tons, bridge over Hudson river, New York, to American Bridge Co.

365 tons, Russian river bridge, Jenner, Calif., to Pacific Coast Engineering Co., Oakland, Calif.

350 tons, buildings, Libbey Glass Co., Toledo, O., to Whitehead & Kales Co., Detroit; H. K. Ferguson Co., Cleveland, general contractor.

300 tons, bridges, Standard Oil Co. of Louisiana, Baton Rouge, La., to local fabricator there.

300 tons, Pennsylvania state bridge, Indiana county, to Fort Pitt Bridge Works Co., Pittsburgh.

170 tons, nurses' home, Gallinger hospital, Washington, to Dietrich Bros., Baltimore; W. O. Rose Co., Goldsboro, N. C., general contractor.

155 tons, school addition, Broad street, Providence, R. I., to James H. Tower Iron Works, Providence, R. I.; E. Turgeon, 36 Exchange place, Providence, general contractor; 30 tons concrete reinforcing bars, to Truscon Steel Co., Youngstown, O.

150 tons, gymnasium and pool, College of Mother Ursula, New Rochelle, N. Y., to Grand Iron Works Inc., Bronx, N. Y.

150 tons, state highway bridges, Massachusetts, to Boston Bridge Works Inc., Boston.

150 tons, building, American Can Co., Honolulu, T. H., to Ingalls Iron Works Co., Verona, Pa.

150 tons, Feilbach school, Toledo, O., to Whitehead & Kales Co., Detroit.

140 tons, plant unit, Merrimac Chemical Co., Everett, Mass., to Boston Structural Steel Co., Cambridge, Mass.

135 tons, church at Sixth and Commonwealth streets, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

125 tons, hospital near Forty-fifth street, Brooklyn, N. Y., to George A. Just Co., Long Island City, N. Y.; listed last week as going to Just Structural Engineering Corp.

125 tons, Ross Island water main project, Portland, Oreg., to Willamette Iron & Steel Works, Portland, Oreg.

115 tons, viaduct, Western Maryland railroad, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, building, Baton Rouge, La., to Ingalls Iron Works Co., Birmingham, Ala.; United Engineers & Constructors Inc., Philadelphia, general contractor.

100 tons, Burbank school, Detroit, to Chapper Iron Works, Detroit; Edwin T. Salkowski, Detroit, general contractor.

Contracts Pending

20,000 tons, second section, west side elevated highway from Twenty-second to Forty-second street, New York; Engineering Department of Manhattan, N. Y., submitting plans to board of estimate for early bids; 10,000 tons or more will be opened later for section, Forty-second to Fifty-ninth street. Pending plans released by action of war department in allowing longer pier head line in midtown section, Manhattan.

6000 tons, open-hearth furnace extension building, Wheeling Structural Steel Co., Wheeling, W. Va.; preliminary plans drawn.

3000 tons, bridge over York river for Gaspe Bridge Co. Ltd., Gaspe, Que.

1800 tons, Harlem avenue bridge, Chicago.

1000 tons, 2-story top addition, department store building, May Co., Cleveland; preliminary plans out; Graham, Anderson, Probst & White, Chicago, architects.

1000 tons, American Red Cross building, Washington; bids Feb. 6; this job listed last week as 400 tons.

850 tons, highway bridge at Sidney, Mont.

700 tons, building, Pennsylvania railroad, Baltimore.

650 tons, building, Sacred Heart college, Granby, Que.

600 tons, remodeling Delaware river bridge at Frenchtown, N. J.; F. H. Clement & Co., Bethlehem, Pa., low on general contract.

600 tons, two bridges, Western Pacific railroad, San Francisco; bids opened.

550 tons, South high school, Cleveland; bids in Jan. 19.

550 tons, magistrates' court and municipal building, Queens, N. Y.

500 tons, 10-story apartment, Pittsburgh; bids in.

400 tons, building, Philadelphia, United Engineers & Constructors Inc., Philadelphia, general contractor.

400 tons, bridge on Fairmont avenue for Ottawa, Ont.; A. F. Macallum, commissioner of works.

400 tons, building, Raymond Bag Co., Middletown, O.; Lockwood-Greene Co., Cleveland and New York, engineers.

400 tons, nurses' home, Greenpoint hospital, Brooklyn, N. Y.

400 tons, highway bridge at Festus, Mo.

350 tons, plant addition, Barber-Greene Co., Aurora, Ill.

300 tons, international house, University of Chicago, Chicago; general contract to R. F. Wilson, Chicago.

250 tons, rebuilding St. Joseph's church, Ottawa, Ont.; J. G. Morton, 86 Adelaide street east, Toronto, Ont., architect.

250 tons, bridges, Pennsylvania railroad.

240 tons, bridge at Felton, Calif., over Southern Pacific tracks; bids opened.

210 tons, material for Pennsylvania railroad, Sunnyside, Long Island, N. Y.; bids Jan. 23.

150 tons, two buildings, Standard Oil Co. of Ohio, Cleveland; general contract to Dresser Co., Cleveland.

150 tons, building, Elmira reformatory, New York, bids Jan. 20.

144 tons, bridge, Brazos county, Texas Highway commission, Austin, Tex.

100 tons, Wenday road bridge, Alden, N. Y., for New York Central railroad.

Unstated tonnage, 20-story hotel at Portland, Oreg., to cost $3,000,000; Ralph E. Lloyd, Los Angeles, announces that general contract was let to L. H. Hoffman and W. S. Dinwiddie, Portland; Morgan, Walls & Clements, architects.

Unstated tonnage, Thirty-fifth street viaduct, Milwaukee; bond issue of $1,900,000 to be sold at once; David McKeith, commissioner of public works.

Unstated tonnage, Monroe avenue bridge at Green Bay, Wis.; bids about April 1; Klug & Smith, 69 East Wisconsin avenue, Milwaukee, completing plans; appropriation, $150,000.

Unstated tonnage, Twenty-second street bridge at Two Rivers, Wis.; bids about Feb. 15; appropriation, $200,000.

Concrete Bars

Awards Fair, Topped by 900-Ton Penitentiary—1100 Tons for Illinois Roads Up at Chicago — 1000-Ton Grain Elevator Up at Buffalo—Price Situation Same

REINFORCING BAR PRICES, PAGE 63

New York—Concrete bar lettings are heavier. Empire Steel Products Co. Inc. booked three projects, totaling 1950 tons, including Rikers island penitentiary, a subway section and a Yonkers sewer job. Public work holds up well, but private construction is taking little steel. Prices on several large jobs have been shaded. A 1500-ton subway job was scheduled for letting this week.

Boston—Coast guard unit buildings at New London, Conn., 520 tons, went to Joseph T. Ryerson & Son Inc. Boston post office will possibly reach closing stage this week. Prices show more strength, 1.90c, Pittsburgh, or 2.30c, being the basis on stock, 100 tons or more. As high as 3.00c is asked on small lots.

Awards Compared

	Tons
Awards this week	**4,981**
Awards last week	**4,464**
Awards two weeks ago	**13,554**
Awards this week in 1930	**3,328**
Av. weekly awards, 1930	**6,990**
Av. weekly awards, 1931	**5,916**
Av. weekly awards, Dec.	**3,937**
Total awards to date, 1930	**13,912**
Total awards to date, 1931	**23,663**

Pittsburgh—Although made up largely of small individual lots, concrete bar tonnage makes a fair showing for this period. Large projects are lacking in inquiry and orders but several are scheduled to appear shortly. The market continues 1.90c to 2.00c for cut lengths and 1.65c to 1.70c for stock lengths. Some endeavor to get 1.75c on small lots.

Buffalo—In excess of 1000 tons for reinforcing material will be needed for an addition to the elevator of the Russell Miller Milling Co. here. Another school inquiry is out, 100 tons. Several other jobs are being figured so that the outlook is much brighter. A Buffalo producer booked 150 tons for a bridge project at Lackawanna.

Chicago—Bids will close Feb. 4 on 1100 tons of concrete bars for state road work, in addition to about 1000 tons now being let, carried over from late 1930. The 1931 Illinois federal aid road program amounts to $47,000,000. Rail steel bars for road work are 1.65c. Verdi and Wendell Phillips high schools, 600 tons, are being refigured.

Birmingham, Ala. — Dealers continue to purchase stocks of concrete bars so that mill shipments are steady and production is increased. Road

(*Concluded on Page 71*)

Strip

Uncertainty Causes Prices to Waver—Changes Are Small—Buying Awaits Mill Activity

STRIP PRICES, PAGE 63

Pittsburgh—Strip steel specifications and shipments were moderately heavier during the past week and January will show a fair gain in output over that of December. Orders from practically all sources are in small lots and the automotive industry declines to anticipate its requirements. Prices are fairly well held at recent levels of 1.65c to 1.70c and 1.55c to 1.60c for the two sizes of hot strip and 2.25c to 2.35c for cold strip. Mill operations vary from week to week with the average about 35 per cent for hot mills and 20 to 25 per cent for cold mills.

Philadelphia—Demand for steel strip is slightly improved. Prices are unchanged and appear firm.

New York—Hot strip continues at 1.55c, Pittsburgh, for wide and 1.65c, for narrow, and cold strip at 2.25c, Pittsburgh. Sellers report little improvement in the sluggish situation, which has prevailed particularly over the past four to five weeks. The termination of inventory taking at consuming plants has not resulted in the expected buying increase.

Youngstown, O.—The strip trade appears to be running a close parallel with the autobody sheet industry, probably due to both being closely identified with the present fortunes of the automotive industry. Some additional independent strip units have been started this week by one maker here, but others have tapered hot-rolling operations a trifle. Hot-rolled brings 1.65c to 1.70c, Pittsburgh, and cold-rolled 2.25c to 2.35c, Pittsburgh and Cleveland.

Cleveland—Moderate increases in hot strip specifications are coming from automobile parts makers. Cold strip orders are scarce. The latter is quoted at 2.25c to 2.35c, Cleveland, the maximum figure being insisted upon for small lots. Hot strip usually is 1.55c and 1.65c, Pittsburgh, for wide and narrow, respectively, while some makers ask $1 a ton more for small lots.

Operating Rate Rises for Fourth Week; Now 46-47

Youngstown, O.—Steel plant operations advanced four points this week to 48 per cent capacity, the fourth increase in as many weeks. A five point advance in Sheet & Tube operations, a two point gain for Republic and resumption at Empire Steel's Falcon plant accounted for the greater activity.

Steel ingot production advanced approximately 10 points for Republic, bringing open-hearth average for the district to 48 against 41 per cent capacity last week. Lap-weld production is higher, buttweld slightly lower and electric-weld pipe unchanged. Four blast furnaces of 19 are melting for the three largest producers. Sheet and strip mill activity is little changed.

Sheet & Tube operations are at 50, Republic at 37, Carnegie is 50, Sharon Steel Hoop is 65 to 70, Newton at 70, and Empire is at 55 capacity.

Approximately 1300 men returned to work as a result of increase in operations, bringing total to 2500 finding employment within last two weeks.

Philadelphia—Eastern ingot production is at 47-48 per cent capacity this week, compared with 44 last week. A further slight increase before the end of January is expected. Both plate and shape mills operate at 40 to 50 per cent of capacity.

Pittsburgh—Ingot production holds about 45 per cent. Sheet output is unchanged at 40 with tin plate higher at 60. Strip and pipe schedules are unchanged at 35. American Steel & Wire Co. has relighted five open-hearth furnaces at Donora, Pa.

Buffalo—Operations of the district are at 43 per cent of capacity but will mount close to 50 per cent by the end of the week.

Cleveland—Ingot rate has tapered two points to 48 per cent capacity this week. Corrigan, McKinney continues with eight open-hearth furnaces on. Sixteen of the district's 34 open hearths are active.

Chicago—Open-hearth production has been increased to 40-45 per cent from barely 40 per cent a week ago. A leading steelworks has relighted a banked furnace at South Chicago, leaving another still banked at Gary. Plate and sheet mills are down slightly from a week ago.

Birmingham, Ala.—Steel works are engaged at 60 per cent capacity with other open-hearth furnaces being put in readiness for probable resumption within two weeks.

Warehouses Reflect Slow Betterment in Demand

Warehouse Prices, Page 88

New York—While showing an improvement over the December rate, jobbing demand continues far from good. Prices generally are unchanged.

Boston—Warehouse business has been fairly good. Materials are in small lots, but aggregate fairly good tonnage.

Philadelphia—Jobbers report further slight improvement in orders. Prices are firm and unchanged.

Pittsburgh—Sales are slow to improve, being only slightly heavier than during late December. Prices are unchanged and fairly steady.

Buffalo—Warehouses report steady increase in sales. Business during the last half of January gives prospect of being better than any equal period in the past 60 days.

Detroit—Iron and steel jobbers feel more cheerful. Volume of business, while still under the corresponding period of 1930, is increasingly encouraging from week to week. Prices remain unchanged.

Cleveland—Demand for iron and steel from warehouse continues to improve. One jobber reports sales at the highest rate in more than three months. Bars and strip continue to move in good volume, while decided increase in demand for sheets and plates also is noted. Prices are unchanged and firm.

Chicago—Warehouse steel orders gain slowly, except in sheets. Ordinarily a setback occurs after the middle of January, but thus far no decline is noted. Prices are unchanged.

Cincinnati—Demand at warehouses is light, showing little change with the turn of the new year. Prices are unchanged.

St. Louis—Warehouses report growing betterment in demand. Specifications and shipping directions have picked up, and a fair volume of new orders is being booked. Improvement is centered chiefly in the general manufacturing trade and automotive and railroad shops.

Rate Delay Is Denied

Washington—Interstate commerce commission Jan. 16 denied the petition of the respondent railroads for postponing the effective date of the third supplemental order in part 6, iron and steel articles rate structure, investigation No. 17,000.

Concrete Bars

(*Concluded from Page 67*)

work is expected to come out by Feb. 15.

Contracts Placed

900 tons, penitentiary, Rikers island, New York, to Empire Steel Products Co. Inc., New York; P. J. Carlin Construction Co., general contractor.

600 tons, subway, route 108, section 9, Queens, N. Y., to Igoe Bros., Newark, N. J.; Arthur A. Johnson Corp., general contractors; reported prematurely Dec. 18 issue as going to same interest.

600 tons, sewer, Yonkers, N. Y., to Empire Steel Products Co. Inc., New York; Montrose Contracting Co., New York.

600 tons, Dupont Circle hotel, Washington, to Capitol Fireproofing Co., Washington.

520 tons, Coast Guard academy, New London, Conn., to Joseph T. Ryerson & Son Inc.

500 tons, coast guard academy buildings, New London, Conn., to Concrete Steel Co., New York; Murch Bros., St. Louis, general contractors.

450 tons, subway, route 107, section 8, Brooklyn, N. Y., to Empire Steel Products Co. Inc., New York; Cornell Contracting Co., general contractor.

390 tons, connecting link, sections 7, 7A and 8, contract No. 43, New Jersey, foundations on caissons, to Igoe Bros., Newark, N. J.; Guarantee Construction Co., New York, general contractor.

200 tons, theater, Wilshire and Western avenues, Los Angeles, to Badt-Falk Co., Los Angeles.

200 tons, church, Sixth and Commonwealth streets, Los Angeles, to unstated fabricator.

200 tons, Illinois road work, to Truscon Steel Co., Youngstown, O.

150 tons, Ridge road viaduct, Lackawanna, N. Y., to Kalman Steel Co.

146 tons, state hospital, Stockton, Calif., to W. C. Hauck & Co., San Francisco.

125 tons, nurses' home, Gallinger hospital, Washington, to Buffalo Steel Co., Buffalo; W. O. Rose Co., Goldsboro, N. C., general contractor.

Chicago.

Contracts Pending

1100 tons, Illinois road work; bids Feb. 4, at Springfield, Ill.

1000 tons, elevator addition, Russell Miller Milling Co., Buffalo; bids in.

600 tons, Verdi and Wendell Phillips high schools, Chicago; figures being revised.

500 tons, Bayonne approach, Kill van Kull bridge, Bayonne, N. J., to Port Richmond, Staten Island, New York; Charles T. Kavanaugh, Bayonne, general contractor.

450 tons, two institute buildings for San Francisco; bids Jan. 21.

390 tons, bridges, Baltimore; bids Feb. 4.

200 tons, warehouse, Sansome and Vallejo streets, San Francisco; bids being received.

169 tons, bridge over Boise river, Boise, Idaho; bids Jan. 27.

152 tons, memorial building, University of California, Berkeley, Calif.; bids being received.

100 tons, school No. 83, Buffalo; Barney Rebescher, Buffalo, low bidder on general contract.

General Electric Shares Held More Widely

Stockholders of the General Electric Co., Schenectady, N. Y., increased in number from December, 1929, to December, 1930, by 56,376. Total number of stockholders at present is 116,750, largest in the company's history.

Most of these are holders of the company's common stock, of which there were 107,150 on record, Dec. 19, 1930. Of this number a certain proportion also own the company's special stock, and in addition 9600 individuals own special stock only. Increase in number of stockholders has been accompanied by an increase in the geographical distribution of the stock.

Pipe

Two Pipelines Placed, 110,000 Tons—Four Cast Pipe Orders Total 7658 Tons—Inquiry Fair

PIPE PRICES, PAGE 88

Chicago—From 3000 to 4000 tons of cast pipe for private public utility work has been closed. Columbus, O., awarded 2000 tons of 30-inch cast pipe, at $41.39, delivered. St. Paul is in the market for 1500 tons of 4 to 12-inch cast. The added unit to the Chicago sanitary district sewage disposal works at Stickney, Ill., will take several hundred tons of special pipe and fittings. Chicago delivered prices for private work in the large diameters are $45.20 to $46.20.

Boston—Interest is revived among pipe producers and prices are firm. Lowell, Mass., wants 2000 tons and two local utilities are about ready to buy. Cambridge, Mass., is expected to proceed with a $1,750,000 high pressure water service, which will take in excess of three miles of 30-inch and a large amount of small size pipe for branches.

New York — The inquiry, noted last week, for 40,000 to 50,000 tons of steel line pipe for export may be increased to 160,000 to 180,000 tons, according to latest information. The project calls for a line from Bagdad to the Mediterranean, and participation of foreign as well as domestic oil companies in this development gives rise to the belief that American makers may encounter stiff competition abroad. Iraq Oil Co. is one of the foreign companies interested.

Phoenix Utility Co. closed on 2225 tons of lapweld steel pipe. New York Power & Light Co., Amsterdam, N. Y., asks for 1785 tons of lapweld. Consolidated Gas Co., this city, is inquiring for 4500 tons of ⅜ to 12¾-inch welded steel pipe.

Cast pipe inquiry has slowed up. Most utilities have covered for the first half. Municipal buying is sluggish. Prices are easy with $35, eastern foundry, prevailing on attractive lots.

Pittsburgh—Distributors of tubular products are slow to increase their stocks. January normally is dull in standard pipe and recent quietness in building operations is aggravating this tendency. Line pipe activity has been quickened by the placing of orders for two large lots, including 30,000 tons of 20-inch pipe for an eastern line, and 80,000 tons of 24-inch pipe for the Texas to Chicago gas line. Most of the latter, awarded to the National Tube Co., is expected to be produced at the Chicago and Lorain plants of this company and will be seamless. The outlook in oil country goods continues poor while activity in tubing and locomotive and boiler tubes has expanded but little since the first of the year. Mill operations hold around 35 per cent.

Cleveland—Jobber demand for merchant pipe holds to the same pace as in recent weeks a carload as needed. East Ohio Gas Co. needs, in the main, are ordered from New York. Prices hold. Buttweld pipe operations do not reach higher than 30 per cent. Lapweld are much better in northern Ohio, owing to some bookings of line pipe.

Birmingham, Ala.—Recent cast pipe lettings have augmented backlogs. Production is steady. Several more specifications are in sight.

Contracts Placed

2500 tons, 6 to 30-inch cast water mains for Portland, Oreg.; 1300 tons, 6, 12 and 24-inch to R. D. Wood & Co., Florence, N. J.; 1130 tons, 8 and 30-inch to United States Pipe & Foundry Co., East Burlington, N. J., through H. G. Purcell, Seattle; and 75 tons, 20-inch to American Cast Iron Pipe Co., Birmingham, Ala., through R. C. Polk, Seattle.

2000 tons, 30-inch cast pipe for Columbus, O., to James B. Clow & Sons, Chicago, at $41.39, delivered.

2000 tons, 4 to 16-inch cast pipe for Minneapolis, to American Cast Iron Pipe Co., Birmingham, Ala.

1158 tons, 6-inch class 150 and 16 and 20-inch class B cast pipe for East

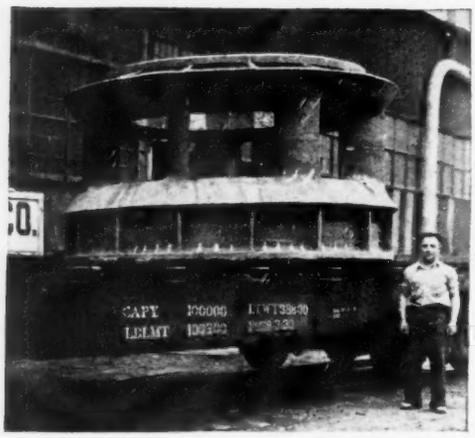
LET'S GET TOGETHER MR.

• and see if ALLEGHENY PRODUCTS can be used to improve your products

WE haven't room on these pages to show you the thousands (literally) of uses for Allegheny steels and alloys. But we should like to get together and discuss the possibilities of using Allegheny Products in the manufacture of your particular product.

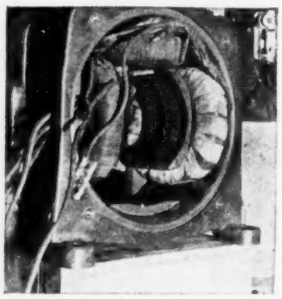
It may be that you could use one of the steels or one of the alloys either in its entirety or partially ... where unusual strength or high resisting properties are needed.

STEEL CASTINGS



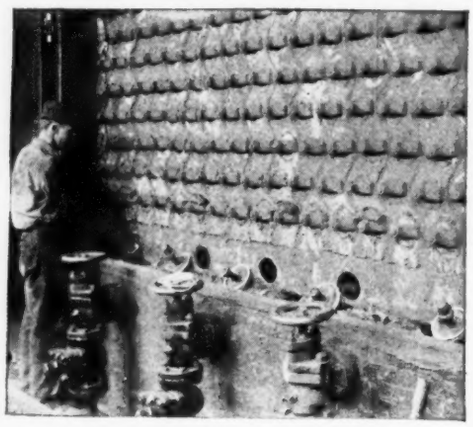
CAST STEEL SPEED RING for hydraulic turbine (approx. wt. 25,000 pounds). Cast by Allegheny foundry. Other castings from 25 pounds to 25 tons. Most modern equipment.

ELECTRICAL SHEETS



THERE ARE ALLEGHENY SHEETS for every electrical use . . . 30 years' experience . . . world's largest manufacturer.

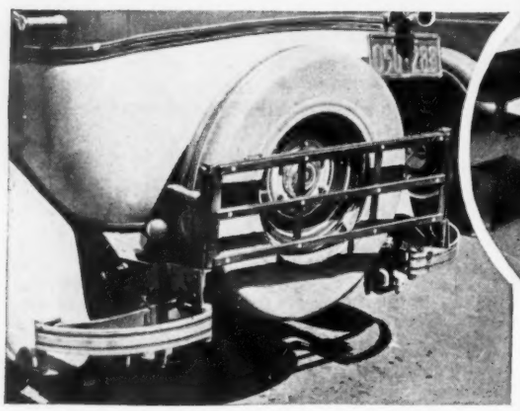
BOILER TUBES



ALLEGHENY BOILER TUBES for stationary, marine and locomotive boilers . . . made of open hearth steel . . . sizes 2" to 6" O.D. Lap welded.

METAL FURNITURE SHEETS

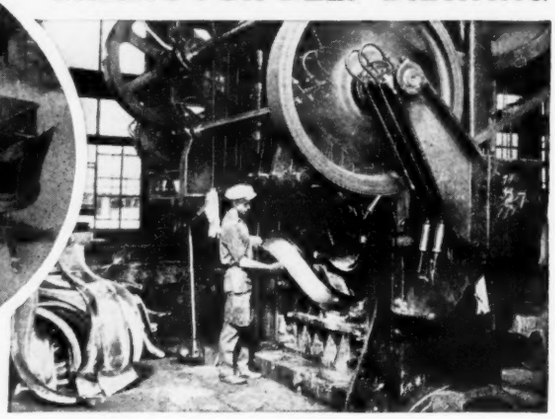
AUTO BODY SHEETS



MANY AUTOMOBILE BODIES, such as this, are made with Allegheny steel sheets. 25 years' experience . . . sizes, up to largest ever used.

SHOWN HERE are but a few of the many products of Allegheny steel furniture sheets . . . known for better surface and flatness.

SHEETS FOR DEEP DRAWING



THIS IS ONE of the many uses for Allegheny deep drawing sheets . . . automobile fenders . . . full range of sizes and gauges offered.

ALLEGHENY STEELS

Allegheny METAL

MANUFACTURER

Some Allegheny Products are noted for their resistance to high heat. Some for their resistance to corrosion. Others for their extreme ease of fabrication. Still others for their great tensile strength.

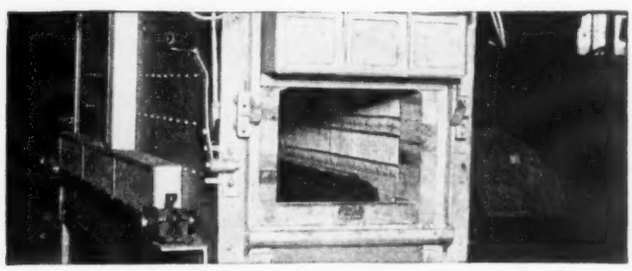
Allegheny Steels and Alloys have already improved the products of many manufacturers. It will pay you to investigate, and find out which of these Allegheny Products—the steels or the alloys—*you* can use to the best advantage.

Write, wire or phone us today. Ask to have an Allegheny engineer call. He has some interesting facts to tell you. Why not get together with him and talk it over?

ALLEGHENY STEEL COMPANY

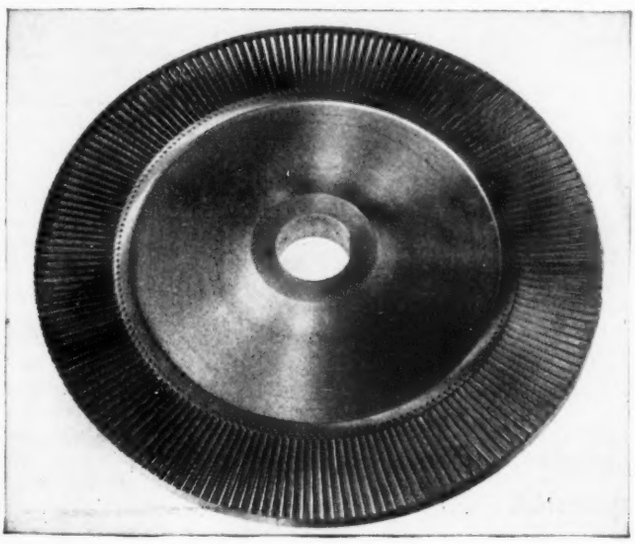
Brackenridge, Pa. . . *Offices:* New York, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Philadelphia, St. Louis, Milwaukee, Los Angeles. *Warehouse Stocks:* Joseph T. Ryerson & Son, Inc.—Chicago, Cleveland, Milwaukee, St. Louis, Cincinnati, Detroit, Buffalo, Boston, Jersey City, Philadelphia. In Canada: Samuel & Benjamin, Ltd., Toronto.

ASCOLOY 44



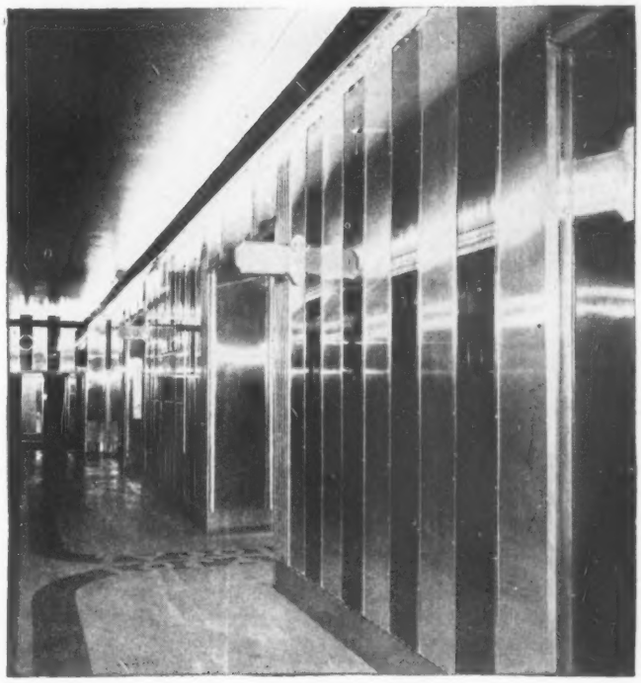
HEARTH OF THIS CONVEYOR drawing furnace is a stamped link belt of Ascoloy 44 . . . withstands temperatures up to 2100 degrees F. . . . resists many corrosives.

ASCOLOY 33



TURBINE WHEEL BUCKETS shown here are made of Ascoloy 33 to withstand high heat and corrosion. This alloy is easily fabricated.

ALLEGHENY METAL



IN THIS LOBBY of the LaSalle-Wacker Bldg., Chicago, Allegheny Metal will stay bright for a lifetime. For this wonder Alloy is unrusting, unstaining, untarnishing, no matter where it is used . . . in hospitals, kitchens, dairies . . . on skyscrapers, on automobiles.

Licensed by the Chemical Foundation, Inc., under basic patents No. 1,316,817 and No. 1,339,378

ASCOLOY 55

FOR EXTREME HEAT resistance (2150 degrees F.) —not easily fabricated—resists many corrosive agents.

ALLEGHENY ALLOYS

Bay municipal utility district, Oakland, Calif., to United States Pipe & Foundry Co., East Burlington, N. J.
335 tons, 16 and 20-inch cast pipe for Winthrop, Mass., to United States Cast Pipe & Foundry Co., East Burlington, N. J.
325 tons, 6 and 8-inch cast pipe for Hammonton, N. J., to R. D. Wood & Co., Florence, N. J.
100 tons, 12-inch cast pipe for Natick, Mass., to R. D. Wood & Co., Florence, N. J.

Steel Pipe Orders

80,000 tons, 24-inch seamless pipe for Continental Construction Co.'s line from Texas to Chicago, to National Tube Co., Pittsburgh.
30,000 tons, 20-inch pipe for Columbia Gas & Electric Co., to Youngstown Sheet & Tube Co., Youngstown, O.
2225 tons, 2, 4½ and 6⅝-inch lapweld steel pipe for Phoenix Utility Co., New York, to National Tube Co., Pittsburgh.

Contracts Pending

2000 tons, 20 and 24-inch cast pipe for Lowell, Mass.; bids taken.
1500 tons, 4 to 12-inch cast pipe for St. Paul.
225 tons, 8 and 10-inch cast pipe for Mansfield, O.
100 tons, 8-inch cast pipe for Waltham, Mass.; bids taken.

Steel Pipe Pending

160,000 to 180,000 tons, pipe line from Bagdad to Mediterranean sea; inquiry out in New York, noted last week as 40,000 to 50,000 tons, may reach these proportions.
4500 tons, ⅜ to 12¾-inch welded steel pipe, for the Consolidated Gas Co., New York.
800 tons, up to 14-inch, heating system, seven buildings, Queens general hospital, Queens, N. Y.; general contract awarded Raisler Heating Co., New York.

Penn Seaboard Plant To Be Pipe Foundry

International Pipe & Mining Co., 122 East Forty-second street, New York, has purchased the property of the Penn Seaboard Steel Corp., New Castle, Del., for conversion into a cast iron pipe plant. Operations to bring about the change will begin within 60 days. Proposed plans for a plant at Chelsea, Mass., have been definitely abandoned.

A centrifugal sand cast pipe will be produced. The plant will be the third producing cast iron pipe along the Delaware river, the other two foundries belonging to the Florence Pipe & Foundry Co., Florence, N. J., and the United States Pipe & Foundry Co., East Burlington, N. J., respectively.

It is estimated the New Castle plant will have a capacity of 150,000 tons annually. Herbert Kennedy is president of the International company, in which Pont-a-Mousson interests in France are heavily interested.

Wire

Jobber Needs Begin to Enliven Trade—Manufacturers' Wire Is Moving at Better Rate

WIRE PRICES, PAGE 63

Chicago—Jobbers are asking heavier shipments of fencing, nails, staples and farm wire for spring trade, but western wire mills remain at 35 to 40 per cent. Additonal nail contracts have been closed at $1.95 to $2.05, Chicago or western mills. Sales surveys show fair prospects in the Northwest and Missouri river territory, but little of encouragement in the South.

Worcester, Mass.—Wire schedules are being maintained. There has been no indication, however, of quickening demand. Prices are holding their own, at 2.40c, base, Worcester, for plain bright wire to dealers.

Cleveland—A leading seller in this district reports good increases in forward purchasing of plain wire, minimum price for which is firm at 2.20c. Nails are said to be firm at $1.90 minimum. A gradual resumption in wire and wire goods purchasing is expected.

New York—Continued dullness prevails in wire products, with nails unchanged at $1.90, Pittsburgh, to jobbers and $2 to the general trade. Plain bright wire is 2.20c, Pittsburgh. Sellers look for little general improvement over the next month or two.

Pittsburgh—Wire demand continues to lag, particularly in jobbing products. Specifications for manufacturers' wire have improved moderately since December but nails and fence material are moving slowly. Prices show fair stability at current levels of $1.90 to $2 for wire nails, 2.20c to 2.30c for plain wire, and $35 for wire rods.

Buffalo—Detroit wire consumers have placed a number of good sized orders for quick shipment and other wire demand is somewhat improved. Jobbers in the lower lake region are said to have small stocks of netting and cloth and substantial deliveries of these materials are expected to begin soon.

Bolt, Nut, Rivet Demand Makes Some Expansion

Bolts, Nuts, Rivets Prices, Page 63

Pittsburgh—Demand for bolts, nuts and rivets continues to expand, aided by better orders from small consumers. Specifications usually are for small lots, however, and business still is seasonally light. Operations lack marked improvement, usually holding around 35 per cent. Prices remain 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets.

New York—Bolt and nut prices are easy at 73 off, and rivets firm at 2.75c, Pittsburgh. Producers at Pittsburgh have been awarded close to 300,000 bolts by the New York Shipbuilding Co. A Portland, Me., rolling mill has taken about 100 tons of tie rods and bolts for a government lighthouse in that city. Except for track accessories, railroad buying is slack. Eastern bolt mills average 35 per cent operation, a slight gain.

Chicago—Producers of bolts, nuts and rivets are operating about four days a week. Specifications remain at the December rate. Sporadic weaknesses in jobber prices of nuts, bolts and small rivets fail to disturb the market. Discounts are 64 to 73 per cent off for bolts and nuts, and 70 to 70, 10 and 5 off for small rivets, $\frac{7}{16}$-inch and smaller.

Ford Purchases More Low-Grade Iron Ore Lands

The Ford Motor Co. has purchased an additional 1000 acres of iron ore land on the Menominee range. About two months ago the company purchased the Walpole property, comprising 300 acres. The 1000 acres were bought from John Marsch, owner of a railroad construction company, and includes a controlling interest in the Millie mine, and the Munro, Few and Northwestern mines. The minority interest in the Millie mine is held by the United States Steel Corp., which worked it from one of its adjacent shafts at the Chapin mine.

The mines are among the smaller mines on the Menominee range, and the acreage is reported to contain mainly a low-grade ore, but with a low content of phosphorus, susceptible to beneficiation. No plan for immediate development of the property has been announced.

November shipments of domestic pumps and water systems, as reported to the bureau of the census by 39 manufacturers, aggregated 6572 water systems, 24,072 pumps and 12,708 cylinders shipped separately.

Try it for *Your* Snagging - -

THE NORTON "B" WHEEL

A TRIAL wherever you are using vitrified wheels is all that is asked - - for the "B" wheel can be depended upon to "sell itself." Combining the advantages of Controlled Structure* with those of "B" Bond* it is a truly *better* snagging wheel. It has longer life at the same production rate; it is stronger, withstanding more abuse; it can be fitted more closely to its job; it is remarkably uniform, eliminating the variation in performance and life often expected of snagging wheels.

Two developments exclusively Norton - - patents pending.

NORTON GRINDING WHEELS

NORTON COMPANY
Worcester, Mass.

W-338

NORTON PRODUCTS—Grinding Machines; Lapping Machines • Grinding Wheels; Abrasives for Polishing; Pulpstones; India Oilstones • Refractories; Porous Plates • Norton Floors—Alundum Tiles and Aggregates

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$17.50
Pittsburgh, district fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Valley, furnace	17.00
Cleveland fur., local del.	17.50
Philadelphia, delivered	17.76
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	20.41 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	17.01 to 17.51
Alabama, del. St. Louis	14.92 to 15.42
Alabama, del. Cincinnati	14.69 to 16.19
Alabama, del. Cleveland	16.51 to 17.51
Ala., Phila., dock del.	16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.00 to 16.50
Ala., Boston dock del.	16.25 to 16.75
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cinn.	14.69 to 16.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	18.00
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	18.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	19.00
Eastern, del. Phila.	19.26

MALLEABLE

Valley furnace	17.50
Cleveland fur., local del.	17.50
Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13
Chicago, furnace	17.50
Buffalo fur., local del.	18.00
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Eastern Penn., del.	17.25 to 17.75
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley furnace	17.00

BESSEMER

Valley furnace	17.50
Pittsburgh, delivered	18.63 to 19.13
Pittsburgh, furnace	18.00

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 28.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.50
Pittsburgh district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50 to 2.60
Connellsville foundry	3.25 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.50 to 12.00
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52-53%	24 to 26 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	23 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$30.00
Pittsburgh, bessemer	30.00
Youngstown	30.00
Cleveland	30.00
Philadelphia	35.30 to 36.30
Chicago	31.00
Forging, Chicago	36.00
Forging, Pittsburgh	36.00
Forging, Philadelphia	40.30 to 41.30

SHEET BARS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00
Chicago	31.00

SLABS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$15.00
Washed gravel, import duty paid east, tide, gross ton	19.00 to 19.50

Pig Iron

Shipments Hold Their Gains—Large Buyers Covered for Quarter—Current Sales Light

PIG IRON PRICES, PAGE 76

Pittsburgh—Activity in the pig iron market gives few signs of steady improvement. Total recovery in shipments since the first of the year is slight, while orders remain small both individually and collectively. The melt by some of the foundries is better than a month ago but still seasonally light, and steel producers are taking only limited lots. Inquiries continue quiet. Prices appear steady despite occasional reports of shading, with No. 2 foundry usually $17, valley, and bessemer and malleable $17.50. Basic is nominally $17.

Boston—Pig iron sales in New England totaled less than 1700 in the past week. A slight gain in the melt is reported. The Rhode Island Malleable Iron Co. Works, Hills Grove, R. I., is in the market for 1000 tons.

New York—Pig iron sales total about 10,000 tons for the week, including 2000 tons of southern foundry. A New England consumer is inquiring for 1000 tons of malleable. Buffalo iron is holding at $15 to $16, furnace, in northern New Jersey, and $15.50 to $16 in other sections of the New York metropolitan district. Southern iron is $16 to $16.50, delivered New York docks. While eastern Pennsylvania foundry iron generally is offered at $17, furnace, this price is shaded occasionally.

Philadelphia — Additional orders for basic iron are being negotiated. Activity in the market for foundry iron is fair. Prices are steady.

Youngstown, O.—A few small lots of foundry and malleable pig iron continue to move from furnace yards to consumers. Output is being kept well in hand by producers through repressed operating rates. No. 2 foundry holds at $17, valley, and malleable and bessemer at $17.50.

Buffalo — Buying continues restricted to moderate size lots for immediate shipment. Inquiry is a little more active than early in January. Prices are unchanged.

Cleveland—Shipments continue on the upgrade and January will show substantial improvement over December. New orders, however, do not reflect much change, bookings by furnace interests with headquarters in Cleveland amounting to 11,000 tons in the past week, slightly less than in the week preceding. The majority of melters are proceeding to buy comparatively small lots for early shipment, rather than closing contracts for the first quarter. The market in Cleveland is quiet, and the furnace price remains $17.50, base, for local delivery. Cleveland furnaces are not competing actively for business in outside territory, though quoting $16, base, furnace, on inquiries from competitive points. In some instances silicon differentials lately have been waived.

Chicago—Scarcely any inquiry for pig iron is noted in the market. Small sales are numerous while large buyers have completed their contracting. Deliveries are much improved over December. It is indicated a number of large buyers ordered more iron for the first quarter than they expect to melt in that period. The price is steady at $17.50, base, Chicago furnace. The market for silvery iron is weak. An automotive interest in this district purchased about 300 tons under the market.

Cincinnati—Southern iron appears firmer at $10.50, base, Birmingham, while northern prices are steady. Sales in this district increased to 3000 tons in the past week. A central Ohio melter is inquiring for 500 tons of foundry iron.

St. Louis—Shipments have increased considerably. The leading local producer's shipments this month are likely to be 50 per cent more than in December. An implement manufacturer has placed a substantial tonnage for first quarter. Other orders are light. Prices are steady.

Birmingham, Ala.—The probable pig iron output for January and February has been fairly well contracted. No increase in production is contemplated. Shipments to outside districts are increasing.

Toronto, Ont.—Sales and inquiries are picking up, though individual orders continue small. Prices are unchanged.

Ferroalloy Shipments Continue To Gain Slowly

Ferroalloy Prices, Page 76

New York—Further slight improvement is noted in shipments of spiegeleisen. Domestic material, 19 to 21 per cent, is unchanged at $30, furnace, in lots up to 100 tons, and foreign spiegeleisen, 26 to 28 per cent, is $34, duty paid, Baltimore. Recent importations have been light. Ferromanganese is unchanged at $85, duty paid, for carloads. Virtually all seasonal contracting in these products has been completed. Shipments of special ferroalloys are keeping pace with gradual gains in steel mill operations. Prices are steady, except for tungsten. The latter is around $3.50, a short ton unit in bond, duty $7.93, with some higher asking prices meaning little. Ferrotungsten is unchanged.

Pittsburgh—Shipments of ferromanganese and spiegeleisen are improving slowly. Little business is appearing in the spot market in which prices continue $89.79, delivered, for ferromanganese and $30, furnace, for spiegeleisen. Activity in other ferroalloys has quickened but little since the first of the year. Prices are unchanged.

Iron Ore Stocks Larger by 1,302,000 Tons

Iron Ore Prices, Page 76

Cleveland—Consumption of Lake Superior iron ore continued downward in December, and for the year 1930 amounted to 45,192,180 tons, compared with 63,645,598 tons in 1929. Stocks at lower lake ports and furnaces Jan. 1 were 1,302,804 tons larger than a year ago, as shown by the following current report from the Lake Superior Iron Ore association:

	Tons
Ore consumed in November	2,639,836
Ore consumed in December	2,338,824
Decrease in December	301,012
Ore consumed in December, 1929	4,076,432
Total ore consumed in 1930	45,192,432
Total consumed in 1929	63,645,598
Ore on hand at furnaces Jan. 1, 1931	32,618,166
Ore on Lake Erie docks Jan. 1, 1931	6,330,509
Total at furnaces and Lake Erie docks Jan. 1, 1931	38,948,675
Total Jan. 1, 1930	37,645,871

Fluorspar Domestic and Import Prices Easier

Fluorspar Prices, Page 76

New York—With seasonal dullness prevailing imported fluorspar prices are slightly easier at $19 to $19.50, duty paid, per gross ton, 85 and 5 per cent. Sellers do not look for contracting until April. Consumption has not been heavy, due to the conditions in the steel industry. The revision in imported fluorspar is largely nominal as no business has been reported.

Domestic spar is now $15.

Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum. Can be equipped with power operated loading hopper.

LOGEMANN SCRAP METAL PRESSES

Hydraulically compressed scrap commands at all times the *best price,* and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.

***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.

PIONEERS!

LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.

Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.

LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.

Scrap

Moderate Increase in Buying Is Felt in All Markets—Prices Are Being Held Well

Chicago—Recent rises and dips have characterized steel scrap here. The latest turn is an easier trend, as heavy melting steel has been turned down by a large buyer at $10.50. Accordingly, some sellers are now quoting $9.75 to $10.25, a reduction of 50 cents. The slow comeback of steelworks operations in this district checks the recent buoyant tendencies. Bearish influences are operating because of shipments due on orders taken at relatively high prices. Dealer interests have been able to buy several grades, including factory hydraulic compressed sheets, below the recent consumer ranges. Melters of foundry cast grades are ordering out material in such small quantities that little life is shown in the cupola

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	7.00 to 7.30
Buffalo, No. 1	10.75 to 11.25
Buffalo, No. 2	9.25 to 9.75
Chicago	10.00 to 10.50
Cinci., deal.	9.50 to 10.00
Cleve., No. 1	10.00 to 10.50
Cleve., No. 2	9.75 to 10.00
Det., No. 1 deal.	9.50 to 10.00
Det., No. 2 deal.	7.00 to 7.50
E. Pa. del. mill	10.00 to 11.00
N. Y. del. R. R.	7.00
N. Y. deal. No. 2	5.50
N. Y., deal. yd.	5.00
Pitts., No. 1	13.00 to 13.50
St. L. No. 1 sel.	10.50 to 11.00
Federal, Ill.	9.75 to 10.25
Granite C., Ill.	9.00 to 9.50
Valleys, No. 1	12.50 to 13.00

COMPRESSED SHEETS

Buffalo, dealers	9.25 to 9.75
Chicago	8.25 to 8.75
Cleveland	9.00 to 9.50
Detroit, dealers	9.25 to 9.75
E. Pa. new mat.	9.00 to 10.00
Pittsburgh	12.50 to 13.00
Valleys	12.00 to 12.50

BUNDLED SHEETS

Buffalo	7.00 to 7.50
Cinci., deal.	8.75 to 9.25
Cleveland	7.00 to 7.50
Eastern Pa.	9.00
Pittsburgh	10.00 to 10.50
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	5.50 to 6.00
Cincinnati	5.00 to 5.50
Detroit, dealers	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	5.50 to 7.00
Buffalo	13.75 to 14.25
Chicago (3 ft.)	12.25 to 12.75
Chicago (2 ft.)	12.75 to 13.25
Cinci., deal.	15.50 to 16.00
Detroit, deal.	12.50 to 13.00
Pitts. (open-hearth, 3 ft. and less)	14.50 to 15.00
St. Louis	13.50 to 14.00

STOVE PLATE

Birmingham	8.00 to 8.50
Boston, con.	8.00 to 8.50
Buffalo	9.00 to 9.25
Chicago, net	7.75 to 8.25
Cinci., deal. net	5.25 to 5.75
Det., net, deal.	6.25 to 6.75
Eastern Pa.	9.00 to 9.50
N. Y., deal. mill	4.75
St. Louis	8.00 to 8.50

COUPLERS, SPRING

Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Eastern Pa.	16.50
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Chicago	11.50 to 12.00
St. Louis	9.50 to 10.00

LOW PHOSPHORUS

Buff., billets and bloom crops	15.00 to 15.50
Cleveland bil. and bloom crops	16.50 to 17.00
Eastern Pa.	17.00
Pittsburgh billet bloom crops	17.00 to 18.00
Pitts. sheet bar crops	16.50 to 17.00

FROGS, SWITCHES

Chicago	10.75 to 11.25
St. Louis	11.00 to 11.50

SHOVELING STEEL

Chicago	10.00 to 10.50
Cleveland	6.75 to 7.25
St. Louis	9.50 to 10.00

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	11.00 to 11.50
Chicago, No. 1	9.50 to 10.05
Chicago, No. 2	10.00 to 10.50
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	13.50
N. Y., No. 1 deal.	10.00 to 10.50
Pitts., No. 2	13.00 to 13.50
St. Louis, No. 1	7.75 to 8.25
St. Louis, No. 2	9.50 to 10.00

SPECIFICATION PIPE

Boston	6.50 to 7.00
Eastern Pa.	11.50 to 12.00
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	9.25 to 9.75
Chicago, No. 1	8.50 to 9.00
Cinn., No. 1 dl.	8.00 to 8.50
Cinn., No. 2	4.50 to 5.00
Cleve., No. 2	6.00 to 6.50
Det., No. 1 new deal.	8.25 to 8.75
St. L., No. 1	7.00 to 7.50
Val. new No. 1	11.50 to 12.00

MACHINE TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	2.00 to 2.50
Buffalo	5.75 to 6.25
Chicago	4.25 to 4.75
Cinn., deal.	4.50 to 5.00
Cleveland	4.75 to 5.25
Detroit	4.25 to 4.75
Eastern Pa.	7.00 to 7.50
N. Y., deal.	3.00
Pittsburgh	6.00 to 6.50
St. Louis	4.00 to 4.50
Valleys	6.00 to 6.50

BORINGS AND TURNINGS For Blast Furnace Use

Boston	2.00 to 2.60
Buffalo	6.00 to 6.50
Cinn., deal.	4.50 to 5.00
Cleveland	6.75 to 7.25
Detroit, deal.	5.25 to 5.75
Eastern Pa.	6.00 to 7.00
N. Y., deal.	3.00
Pittsburgh	7.75 to 8.25

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.00 to 8.00
Boston, chem.	9.10 to 9.60
Boston, deal.	2.00 to 2.50
Buffalo	6.00 to 6.50
Chicago	5.50 to 6.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.75 to 7.25
Detroit, deal.	5.25 to 5.75
Eastern Pa.	7.00 to 7.50
E. Pa., chem.	13.50 to 14.50
N. Y., deal.	3.50
Pittsburgh	7.75 to 8.25
St. Louis	6.00 to 6.50

PIPE AND FLUES

Cinn., deal.	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	7.00 to 7.50
Chicago, net	8.00 to 8.50
Cincinnati	7.00 to 7.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	6.00
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston, deal.	6.00 to 6.25
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	8.00 to 8.50

FORGE SCRAP

Boston, del.	5.50 to 6.00
Chicago	13.50 to 14.00
Eastern Pa.	11.00

ARCH BARS, TRANSOMS

Chicago, net	11.50 to 12.00
St. Louis	11.50 to 12.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	10.50 to 11.00
Chi., steelworks	9.00 to 9.50
Cleveland	9.50 to 10.00
Eastern Pa.	11.00
Pittsburgh	10.50 to 11.00
St. Louis	7.50 to 8.00

STEEL CAR AXLES

Birmingham	14.00 to 14.50
Boston, ship. pt.	14.00 to 15.00
Buffalo	15.50 to 16.00
Chicago	14.60 to 15.10
Eastern Pa.	18.50 to 19.50
St. Louis	14.50 to 15.00

SHAFTING

Bos., ship. pt.	13.00 to 13.50
Chicago	12.90 to 13.45
N. Y., deal.	13.00 to 14.00
St. Louis	12.00 to 12.50
E. Penna.	18.00

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	13.50 to 14.00
Chicago, iron	11.00 to 11.50
Chi., roll steel	13.50 to 14.00
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	15.50 to 16.00
E. Pa. iron	13.50 to 14.00
Pitts., iron	13.75 to 14.25
Pitts., steel	16.00 to 16.50
St. Louis iron	10.50 to 11.00
St. Louis, steel	13.25 to 13.75

NO. 1 CAST SCRAP

Birming., cup.	9.50 to 10.00
Buffalo (mach.)	10.00 to 10.75
Boston, textile	11.50 to 12.00
Chicago, mach.	10.65 to 11.20
Chi., railroad	10.10 to 10.65
Chicago, agri.	9.50 to 10.10
Cinn., mach. cup., gross	13.50 to 14.50
Cleve. cupola	12.00 to 12.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	13.00
N. Y. cup. deal.	8.00 to 8.50
N. Y., del. local foundries	12.00
Pitts., cupola	12.50 to 13.00
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	9.75 to 10.25
St. L. No. 1	9.00 to 9.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast.	11.50 to 12.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.50 to 7.00
Eastern Pa.	11.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.00 to 7.50
Pittsburgh	10.50 to 11.00

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	12.50 to 13.00
Chicago, agri.	11.00 to 11.50
Chicago, R. R.	12.75 to 13.25
Cinn., R. R. dl.	12.00 to 12.50
Cinn., agri., dl.	12.00 to 12.50
Cleve., rail	12.50 to 13.00
Det. auto deal.	11.00 to 11.50
St. Louis, rail	10.50 to 11.00

RAILS FOR ROLLING 5 feet and over

Birmingham	11.25 to 11.50
Boston	8.50 to 9.00
Buffalo	10.00 to 10.50
Chicago	13.00 to 13.50
Eastern Pa.	13.00 to 13.50
New York	9.00 to 9.50
St. Louis	11.25 to 11.75

LOCOMOTIVE TIRES

Chicago, cut	13.00 to 13.50
St. L. No. 1	11.00 to 11.50

LOW PHOS. PUNCHINGS

Chicago	11.50 to 12.00
Buffalo	14.00 to 14.50
Eastern Pa.	15.50 to 16.50
Pittsburgh	15.50 to 16.50

market. Credit conditions seem to be improving. A few items have been marked down about 25 cents in line with the ability of dealers to purchase. On the other hand, bids on railroad scrap are at a relatively higher level than published consumer quotations.

New York—Reductions in heavy breakable cast scrap, which is now holding at $7 to $7.50, and in yard steel for eastern consumption, now $5, New York, feature the local dealers' scrap market. Other grades are unchanged but in several cases quotations are little more than nominal. While shipments against back contracts are somewhat larger, fresh consuming demand is quiet.

Philadelphia — Trading in steel and iron scrap is restricted and small and moderate lots rule, with prices unchanged.

Pittsburgh—Steel and iron scrap is quiet following fairly broad buying in moderate lots. Some additional small sales of heavy melting steel have been made at $13.50, but the tone of the market is slightly unsteady. Compressed sheets are not plentiful in this district and the market is steady at $12.50 to $13, despite new buying at $12.50. Blast furnace grades are quiet.

Buffalo—No. 1 heavy melting steel is now being accepted in small quantities for the first time in 30 days. Restricted tonnages of No. 2 steel also are moving. Demand for other material is slow and prices are nominal, and in some instances, fractionally lower.

Cleveland—Steel and iron scrap is slightly easier this week, with weakness centered principally in steelmaking grades. No. 1 heavy melting steel is quoted 25 cents a ton lower at $10 to $10.50 as is No. 2 at $9.75 to $10.00. This weakness is attributed to projected holdup of shipments by a large steelworks consumer coincident with a reduction in its operating rate. The leading consumer continues out of the market. This latter interest is reported to have refused material at well below current price levels. Scrap stocks piled in mill and dealer yards are estimated to be more than sufficient to supply local consumption needs for six months. Some material is moving to Warren and Youngstown, but this is not sufficient to bolster the local market. Quotations in the Valley are unchanged.

Detroit—Cast iron borings, mixed borings and short turnings, machine shop turnings and short shoveling turnings have shown further firmness. Quotations on compressed sheets likewise are stronger. Auto production of scrap has been increasing since the first of the year. Bethlehem Steel Co. is in the market locally for shipment into Lackawanna at Buffalo as soon as navigation opens in the spring.

Cincinnati—Recent railroad scrap lists brought slightly higher quotations, but it is believed little of the material came to this district. Mills take scrap in limited quantities and new business is scarce. Prices are nominally unchanged.

St. Louis—For the fourth consecutive week prices of steel and iron scrap are unchanged. Actual values are difficult to gage, due in the case of some items to scant sales, and in others to widely divergent views of buyers and sellers. Buying is still in small volume and spotty. Users enjoying a strong cash position have been endeavoring to invest heavily at present low prices, but are meeting resistance on the part of sellers.

Birmingham, Ala.—Melters are buying a little more liberally though the total is nothing like normal. The steel corporation subsidiary purchased 1000 tons for delivery over three months, from dealers in Tuscaloosa, Ala. Heavy melting steel holds at $11, maximum, with $9.50 on general run.

Toronto, Ont.—While some improvement was reported in sales new business is appearing slowly. Much of the current demand, confined to spot delivery, is for immediate needs. Future buying is lacking. Most of the new demand is for iron grades from foundry consumers.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Coke

Improvement in Foundry Fuel Demand Is Moderate—Industries Consuming Less

COKE PRICES, PAGE 76

Pittsburgh—Beehive coke demand is slow to increase. Furnace coke activity remains dull as a month ago while improvement in foundry fuel consumption is only moderate. Restricted industrial operations are retarding heating coke shipments, although domestic demand is fair. Prices are unchanged on all grades. Production of beehive coke in the Connellsville district is heavier following the holiday interruption. Output for the week ending Jan. 10 was 19,130, against 13,640 the week preceding, and 25,670 tons in the week a year ago.

Boston—Foundries are taking more coke than in some time. Domestic sizes are in good demand.

St. Louis—Specifications for metallurgical coke have failed to gain and new orders are restricted to small lots for immediate shipment. The melt is expected to improve the latter part of this month.

Cincinnati—Specifications for by-product foundry coke show a moderate gain. Prices are unchanged.

Birmingham, Ala.—Coke production is being increased. Shipments to Cuba and Pacific coast ports are noted. By-product foundry coke has held at $5, base, Birmingham, for more than two years.

General Electric's Orders Declined in 1930

General Electric Co., Schenectady, N. Y., received orders during 1930 amounting to $341,820,312, compared with $445,802,519 for 1929, a decrease of 23 per cent, President Gerard Swope has announced, in a recent statement.

Orders for the fourth quarter of 1930 amounted to $74,168,480, compared with $108,398,049 for the last quarter of 1929, a decrease of 32 per cent.

As a result of the transfer of radio set and tube business, outlined in the company's 1929 annual report, orders received in 1930 do not include radio sets and tubes, except orders received for the new General Electric radios introduced in the latter part of the year.

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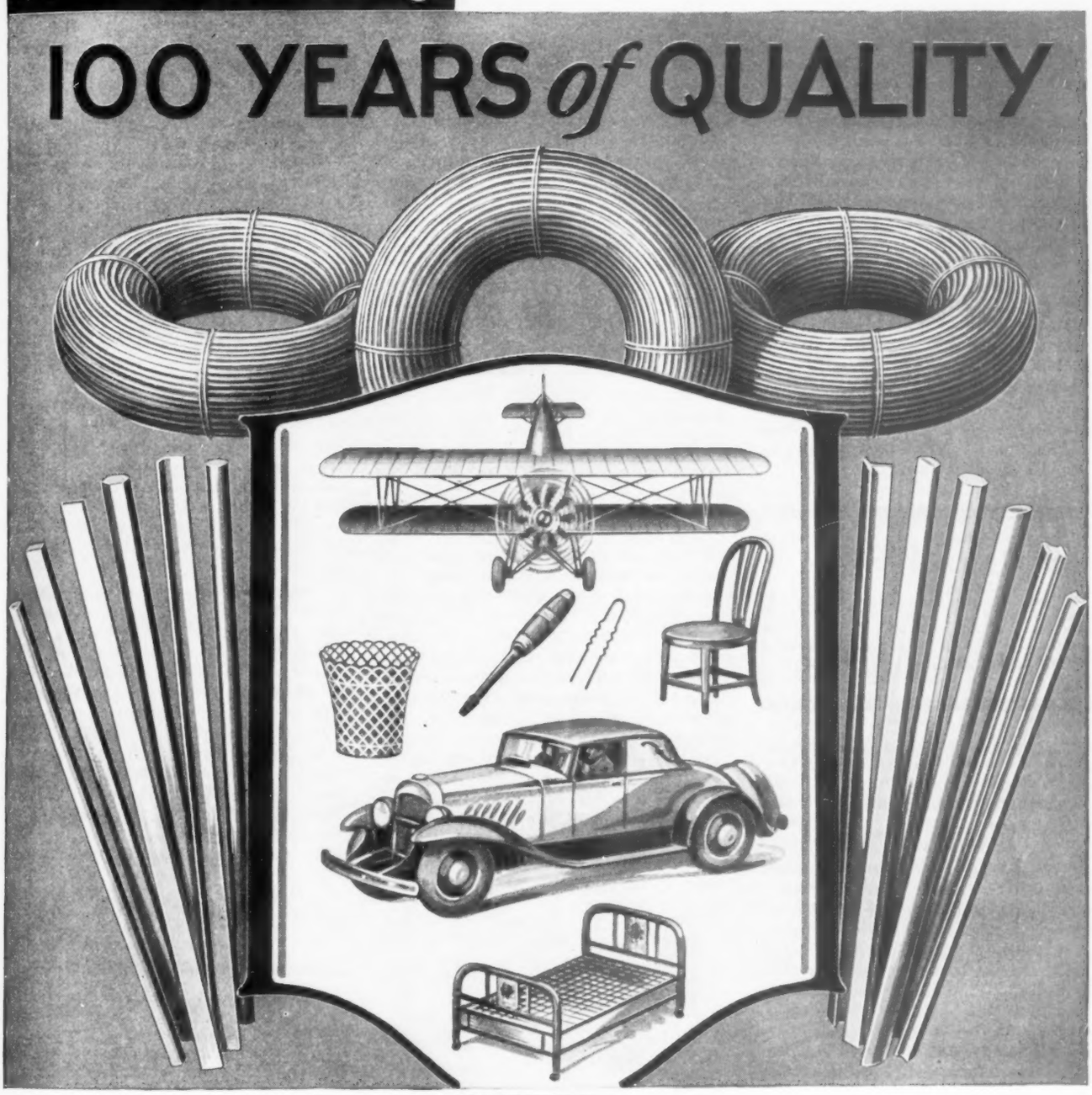

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Export Distributors: United States Steel Products Company, New York

Pacific Coast

Sales and Inquiries Showing Improvement—Some Products Move Equal to 1930 Volume—Pipe Sales Hold Good Total—Concrete Bar Bookings Start Year with Active Demand

Seattle—Except for the award of 2500 tons for cast iron pipe by Portland, Oreg., awards in the Pacific Northwest this week were of minor importance. Several large projects are pending and the outlook is fairly promising. Business sentiment is more optimistic although conditions as a whole show little change from last month. Steel prices are unchanged.

Ulen & Co., 120 Broadway, New York, are reported to be the sponsors of a proposed water system to cover a large suburban area between Seattle and Everett, Wash., application for which has been filed with county officials.

Public highway work looms large in projects proposed for early action. Montana expects to have awarded contracts exceeding $3,500,000 by March 1. Both Washington and Oregon also have extensive road projects planned for the next six months.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

No large reinforcing bar contracts have been awarded local mills this month although about 1500 tons are pending. No important new projects have developed but the outlook is fair. Merchant bar business is slow and inquiry lacking. The two local manufacturing plants are occupied with contracts placed last month. Reinforcing materials are unchanged at 2.30c. Several small jobs are ready to be awarded.

Inquiring for plates is confined to small tonnages. Seattle has a 36-inch water pipe line job pending but specifications are not yet out. Beall Tank & Pipe Co., Portland, booked 175 tons for the Ross Island water project at Portland. Bids are to be opened next week for an irrigation project at Chelan, Wash., requiring 1300 tons. Mill prices are unchanged at 2.10c.

Hart Construction Co., Tacoma, has the general contract for a steel bridge over the Puyallup river, Pierce county, involving 315 tons of shapes. Willamette Iron & Steel Works, Portland, has the contract for furnishing 125 tons of structurals for the Ross Island project at Portland. No award has been placed for the 3300 tons for the proposed Ford plant at Seattle. The largest job proposed calls for 5500 tons for transmission towers for the Seattle light department. Specifications are not yet out.

Finished Materials

The warehouse trade is quiet, no specifications of moment being up for figures. Dealers are buying only in small lots out of stock. Warehouse prices remain unchanged.

Pipe

Portland's purchase of 2500 tons of 6 to 30-inch cast iron pipe has been divided among three suppliers. R. D. Wood & Co. Philadelphia, will supply about 1300 tons, United States Pipe & Foundry Co. 1130 tons, and American Cast Iron Pipe Co. 75 tons. The three contracts totaled $99,263. Commercial Iron Works, Portland, was low bidder for furnishing 25,000 pounds of special castings for the same project. New projects include 8 miles of 1 to 6-inch pipe for Foster, Wash., bids Jan. 24, and 10,500 feet of 6 and 14-inch cast iron pipe for Puyallup, Wash., bids late in January.

Old Materials

There is no change in the scrap market. Unfavorable weather and restricted territory have reduced receipts this month but local mills are paying only $8 and $8.50, gross ton, for both steel and cast iron scrap. Supplies at local plants exceeded normal requirements.

Building Demand Gains

San Francisco—(*By Air Mail*)—Sales and inquiries have improved during the past ten days and a number of new projects have been announced that should come up for figures within the next 30 days. Of special importance this week was the award of over 60,000 tons of rails by the Southern Pacific Co. A number of fair sized lots of cast iron pipe were also reported.

Concrete bar bookings totaled close to 1000 tons and brought the aggregate to date to 2994 tons, compared with 691 tons for the corresponding period in 1930. W. C. Hauck & Co. took 146 tons for a hospital in Stockton, Calif., and Badt-Falk Co. booked 200 tons for a theater on Western avenue, Los Angeles. A church on Sixth street, Los Angeles, 200 tons, went to an unnamed interest. New inquiries include 150 tons for a building for the University of California, Berkeley, Calif., 450 tons for two institute buildings for the city of San Francisco and 169 tons for a bridge over the Boise River at Boise, Idaho. No change in prices on out-of-stock material in the Los Angeles and San Francisco district is noted, at 2.50c, base, on carload lots.

Plates and Shapes Active

The first plate award of over 100 tons placed this year went to the Western Pipe & Steel Co., 640 tons for a 51-inch welded steel pipe line for Los Angeles. Awards for the same period a year ago aggregated 5721 tons. Bids were opened on 243 tons for tanks at Boulder City, Nev., for the bureau of reclamation. An award on 1300 tons for a 4 to 30-inch welded steel pipe line at Chelan, Wash., is expected to be placed next week.

Awards of structural shapes totaled 1973 tons, bringing the aggregate for the year to 2283 tons, compared with 4466 tons for the first two weeks of 1930. The Pacific Iron & Steel Co. took 135 tons for a church in Los Angeles, the Pacific Coast Engineering Co. secured 365 tons for the Russian river bridge at Jenner, Calif., and the Moore Drydock Co. booked 787 tons for the Feather river bridge at Pulga, Calif. Bids were opened this week on 240 tons for a bridge at Felton, Calif., and on 600 tons for two bridges for the Western Pacific Co. Plain shapes remain unchanged at 2.15c to 2.25c, c.i.f.

Other Finished Material

Cast iron pipe awards totaled 4603 tons and brought the aggregate for the first two weeks of the year to 6346 tons, compared with 6670 tons for the corresponding period a year ago. The United States Pipe & Foundry Co. took 1158 tons for Oakland, Calif. The Youngstown Sheet & Tube Co. secured 2370 tons for the Associated Oil Co. The construction of a 200 mile, 24-inch, pipe line from Kettleman Hills to Los Angeles, will be started in April by the Southern Fuel Co. Approximately 49,000 tons will be involved.

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.00c, Conn., for copper

Sheets	
Yellow brass (high)	17.12½
Copper, hot rolled	19.75
Lead, full sheets (cut ½c more)	8.75
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.00
Seamless copper	22.12½
Rods	
Yellow brass (high, full turnings)	15.37½
Naval brass	16.37½
Anodes	
Copper, untrimmed	17.25
Wire	
Yellow brass (high)	17.62½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	6.25 to 6.50
Cleveland	7.00 to 7.50
St. Louis	7.00 to 7.25
Heavy Yellow Brass	
New York	4.75 to 5.00
Heavy Copper and Wire	
New York	7.75 to 8.00
Boston	7.25 to 7.50
Chicago	7.25 to 7.75
Cleveland	7.25 to 7.50
St. Louis	6.50 to 7.00
Red Brass Borings	
New York	6.75 to 7.00
Yellow Brass Tubing	
Cleveland	4.00 to 4.50
Light Copper	
New York	6.75 to 7.00
Chicago	6.00 to 6.50
Cleveland	6.50 to 7.00
St. Louis	6.50
Light Brass	
Boston	3.50 to 3.75
Chicago	4.25 to 4.50
Cleveland	3.25 to 3.50
St. Louis	3.75 to 4.00
Zinc	
New York	2.00 to 2.25
Cleveland	1.25 to 1.75
St. Louis	2.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	8.50 to 9.00
Borings, Cleveland	4.50 to 5.00
Mixed cast, Cleveland	5.50 to 6.00
Mixed cast, Boston	5.00 to 5.50
Mixed cast, St. Louis	4.25

Secondary Metals

Remelt aluminum No. 12	11.50 to 12.50
Brass ingots, 85-5-5-5	10.00

Quicksilver $105-106

New York—Quicksilver is quiet at $105 to $106 a flask for small spot lots in the East.

Metals

Foreign Demand for Copper Is Active but Domestic Sales Lag —Zinc Is Quiet—Tin Firmer

New York—Buying of nonferrous metals has been light during the past week and prices have shown little change. Producers are better able to resist quietness than in some previous periods because they have succeeded in balancing production against consumption. For two months in succession, total stocks of blister and refined copper have been reduced moderately, and indications point to still lower production in January. The zinc situation is somewhat similar after more than a year of a steadily rising surplus. Lead production was curtailed further, recently, but the December statistics again were weak. Tin production probably is in excess of consumption.

Copper—The firmer statistical situation is somewhat offset by the extraordinary size of stocks and the well covered position of consumers for the next few months. Since the market reacted to 10.00c a little more than a week ago, it has remained steady at that figure. Domestic demand has been extremely light, while export has been good. Most producers remain out of the market.

Zinc—Demand for prime western has been quiet. For positions two months or so ahead, more producers are asking a slightly higher figure than for prompt. The ore market continues unchanged at $26 a ton. On account of extremely low production it appears only a matter of time until demand sends prices up, but with London prices the lowest in more than half a century, any recovery here would be limited without inviting a certain amount of competition from foreign metal. Present curtailment of output accounts for resistance of producers to going below 4.00c.

Tin—The four principal producing countries have approved the export quota restriction plan of the Producers' association and it is thought that this will have a strengthening effect on the market. In the past few days, prices have been a little stronger than they were a week ago. Consumers in this country are carrying larger inventories of tin than they did some time past. Buying has been light. Statistics continue decidedly weak.

Lead—Demand is light and routine for prompt shipment, but prices are steady at the level to which they were reduced recently.—*Daily Metal Trade.*

Coke By-Products Easier; Benzol Price Shaded

New York—Shading of 21c on benzol is reported, although no official announcement of a reduction has been made. Sales also have been closed at 20c. Buying is light and confined largely to small lots. Toluol is dull, but firm. Phenol is moving in fair volume, the bulk of the material going at 17c. Some weakness also is reported in naphthalene. Contract shipments are fairly active. On attractive business current prices are reported shaded. Xylol buying has improved since the first of the year, but prices are easy.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

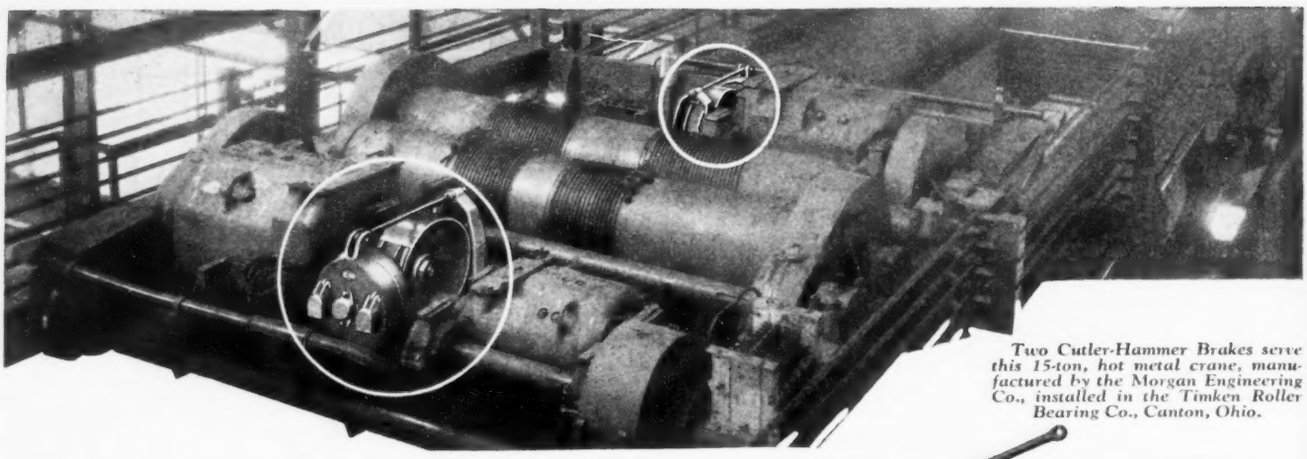
	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.95 to $2.00

Harbison-Walker Refractories Co., Pittsburgh, has made a film depicting manufacture of refractories, for use by technical and engineering organization and schools.

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Jan. 14	10.00	10.12½	9.87½	25.65	26.00	4.75	4.55	4.02½	22.90	7.50	35.00
Jan. 15	10.00	10.12½	9.87½	25.57½	25.95	4.75	4.55	4.02½	22.90	7.50	35.00
Jan. 16	10.00	10.12½	9.80	26.25	26.60	4.75	4.55	4.02½	22.90	7.50	35.00
Jan. 17	10.00	10.12½	9.80	26.25	26.60	4.75	4.55	4.00	22.90	7.50	35.00
Jan. 19	10.00	10.12½	9.80	26.00	26.35	4.75	4.55	4.00	22.90	7.40	35.00
Jan. 20	10.00	10.12½	9.80	25.87½	26.20	4.75	4.55	4.02½	22.90	7.40	35.00

"Spendthrift" brakes . . . *and steel-mill economy?*



Two Cutler-Hammer Brakes serve this 15-ton, hot metal crane, manufactured by the Morgan Engineering Co., installed in the Timken Roller Bearing Co., Canton, Ohio.

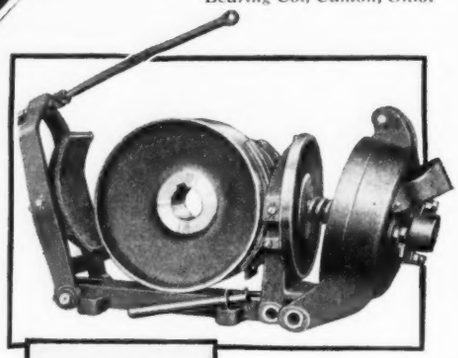
EACH additional moving part on a brake is an additional spendthrift of power, an additional source of wear and trouble . . . all of which is in direct contrast to the rigid standards of economy demanded by profitable production.

Such standards dictate Cutler-Hammer "Type M" Brakes every time . . . embodying the simplest design, the most direct application of power. There are no toggles, no bell-arms, no power transmitted "around a corner".

But, additional to a minimum of parts, it has other obvious advantages as well: braking torque, transmitted, *not* in "wrap-around" fashion, but at right angles to the wheel, is even, uniform throughout; brake linings wear slowly, wear *evenly*, give better, more effective stopping power, last longer, cause less trouble; braking torque is equally effective on "forward" and "reverse".

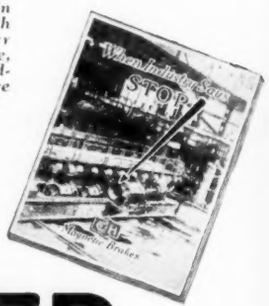
This high efficiency is carried throughout. The long powerful spring needs less adjustment and attention. Oversize bearings, bushed, last longer. The magnet, impregnated, varnished, baked, is an *any*-weather magnet. Adjustments are made easily, quickly. The large drum and brake-shoe area gives positive braking at the lowest pressure per square inch.

For economy, full efficiency over a greater number of years, for freedom from trouble, investigate C-H "Type M" Brakes fully. Send for the booklet, "*When Industry Says Stop*".



Exploded view of C-H "Type M" Magnetic Brake showing few parts, simplicity of design and direct power application.

Automatic brake-shoe adjustment feature always maintains shoes in correct alignment with drum. This, together with short shoe stroke, eliminates need of adjustment until linings are practically worn out.



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Pioneer Manufacturers of Electric Control Apparatus
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CUTLER HAMMER

Electric Brakes for A.C. or D.C. Service

(A-4065)

Europe

British Steel and Ferromanganese Producers Rebate $1.21 to Exclusive Users

London—(*By Cable*)—The British Steel Manufacturers association has announced it will rebate 5 shillings ($1.21) a ton to consumers exclusively using British steel. Recently pig iron producers agreed on rebates of a similar nature. This is a substantial increase over the rebates that have been in effect for some time. The association of ferromanganese manufacturers also has decided to grant a rebate of 5 shillings to exclusive users of its members' products.

Large locomotive orders are being received from India. The Indian tariff, however, has reduced demand for British galvanized sheets. Belgium is competing keenly. Tin plate inquiry is improving. The Barrow iron and steel works is restarting two blast furnaces and its rail mills. Better demand is noted for hematite.

The markets in France and Belgium show no improvement. Conditions in France are slightly less favorable than they have been recently. In Belgium prices are moving downward. German iron and steel manufacturers are greatly in need of more business, STEEL's correspondent at Berlin reports. The German Iron Masters' organizations have reduced prices of all iron products an average of 6 per cent as of Jan. 1.

British iron and steel imports in December totaled 283,038 tons, compared with a total of 209,769 tons in November and 256,429 tons in December, 1929. December exports were 169,544 tons, compared with 203,919 tons in November, and 331,977 tons in December, 1929.

British Steel Operations Are at Slow Rate

Birmingham, Eng.—Little business has been moving at the weekly markets held since the Christmas holiday but some useful contracts have been placed and others are pending for ratification within the next few weeks. Dorman Long & Co., Middlesbrough, have been particularly successful lately in booking contracts for bridge work, and on the last day of 1930 it was announced that they are to build a new bridge at Newport, Middlesbrough, to cost £616,000. It is to be built by the Durham county council and the Middlesbrough town council and is to be financed to the extent of 75 per cent of the cost by the government.

The Great Western railway announced a big list of new work automatically released for 1931, including relaying of 400 miles of track and reconstruction of bridges and docks. For the modernization of docks it has allotted £406,000. No less than £1,199,000 is to be spent on rolling stock and locomotives to be built in its own workshops and about £126,600 will be spent on new road vehicles in connection with road transport development which now forms part of the company's activities. The company is to build new garages in London and several big British towns.

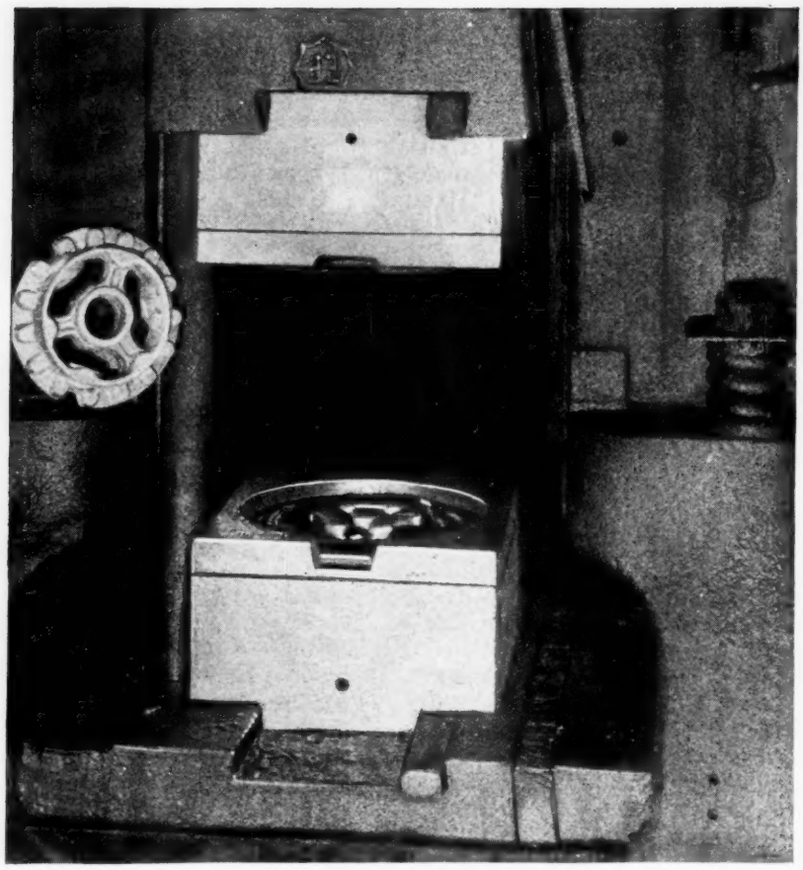
On the northeast coast holiday stoppages were extended in many cases for nine days, owing to depressing conditions of trade. Steelworks in the Dorman Long group were mostly closed until Jan. 5 but in the case of other large concerns the stop-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, January 19	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$14.19	2 18 6*	$12.61	2 12 0	$12.61	2 12 0	$12.13	2 10 0
Basic-bessemer	14.55	3 0 0†	11.64	2 8 0	11.64	2 8 0	13.34	2 15 0
Hematite, Phosphorus 0.02-0.05	16.98	3 10 0	.....	.....	.....	.....	$16.98	3 10 0
SEMIFINISHED STEEL								
Billets	$27.28	5 12 6	$17.46	3 12 0	$17.46	3 12 0	$17.46	3 12 0
Wire rods	41.23	8 10 0	29.10	6 0 0	29.10	6 0 0	29.10	6 0 0
FINISHED STEEL								
Standard rails	$40.01	8 5 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.68c	7 15 0	.91c	4 2 6	.91c	4 2 6	.96c	4 7 0
Structural shapes	1.68c	7 15 0	.81c	3 12 6	.81c	3 12 6	.85c	3 17 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.03c	4 13 6	1.03c	4 13 6	1.07c	4 17 0
Sheets, black, 24 gage	1.90c	8 15 0	1.78c	8 1 6	1.78c	8 1 6	1.93c	8 15 0
Sheets, galvanized, 24 gage, corrugated	2.44c	11 5 0	2.35c	10 13 9	2.35c	10 13 9	2.31c	10 10 0
Bands and strips	2.06c	9 10 0	1.02c	4 12 6	1.02c	4 12 6	1.01c	4 12 0
Plain wire, base	2.06c	9 10 0	1.21c	5 10 0	1.21c	5 10 0	1.23c	5 12 0
Galvanized wire, base	3.04c	14 0 0	1.49c	6 15 0	1.49c	6 15 0	1.54c	7 0 0
Wire nails, base	2.39c	11 0 0	1.21c	5 10 0	1.21c	5 10 0	1.23c	5 12 0
Tin plate, base box 108 pounds	$3.81c	0 15 9	.....	.....	.....	.....	$ 8.26	1 14 0
Domestic Prices at Works or Furnace—Last Reported				French Francs		Belgian Francs		Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$15.40	3 3 6	$11.56	295(2)	$14.23	510	$19.72	83
Basic pig iron	15.76	3 5 0	13.52	345(1)	12.56	450	21.01	88.50
Furnace coke	2.91	0 12 0	6.59	168	5.02	180	5.08	21.40
Billets	27.28	5 12 6	19.21	490	18.55	665	27.91	117.50
Standard rails	1.79c	8 5 0	1.41c	485	1.59c	1,220	1.46c	136
Merchant bars	1.68c	7 15 0	.97c	540	1.02c	785	1.47c	137
Shapes	1.84c	8 10 0	1.12c	620	.96c	740	1.43c	134
Plates, ship, bridge and tank	1.95c	9 0 0‡	1.37c	760	1.14c	875	1.64c	153
Sheets, black, 24 gage	1.90c	8 15 0	2.29c	1,270	2.41c	1,850	1.34c	126
Sheets, galvanized 24 gage, corrugated	2.44c	11 5 0	3.06c	1,700	2.73c	2,100	3.64c	340
Plain wire	2.06c	9 10 0	2.16c	1,200	2.15c	1,650	2.32c	217
Bands and Strips	2.06c	9 10 0	1.22c	680	1.43c	1,100	1.70c	159

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.



Illustrated at right are Heppenstall Nickel Alloy Steel "Hardtem" die blocks in plant of Union Switch & Signal Co., Swissvale, Pa. Mfd. by HEPPENSTALL COMPANY, Pittsburgh, Pa.

HEPPENSTALL... KNOWS NICKEL ALLOY STEEL DIE BLOCKS PERFORM BETTER LONGER

For a generation the Heppenstall Company has occupied a leading position as a manufacturer of die blocks. All Heppenstall alloy die block steels contain Nickel and are made in the company's own furnaces, under close technical supervision. The addition of Nickel imparts the uniformity of structure, ease of heat treatment and shock resistance so necessary in die block service.

Judge by this statement from the Heppenstall Company regarding the use of Nickel Alloy Steel in Heppenstall "Hardtem" blocks:

"Modern drop forging die blocks must not only withstand the heavy stresses developed in service, but the chemical composition of the die steel must be such as to minimize the tendency toward warping and disintegration by abrasion and fire checking, for the drop forging of today is a near-finished product... It is obvious therefore that the die steel must be of the highest quality".

Like many other leading manufacturers of forge and mill equipment parts, Heppenstall knows that "Nickel Alloy Steels perform better longer".

Dependable materials are the best assurance of dependable performance

Send for "Buyers' Guide to Nickel Alloy Steel Products."

INCO NICKEL TRADE MARK

Nickel
ALLOY STEEL
PERFORMS BETTER LONGER

THE INTERNATIONAL NICKEL COMPANY, Inc.

Miners, refiners and rollers of Nickel... Sole producers of Monel Metal

67 Wall Street, New York, N. Y.

page was limited to three days both in Christmas and the New Year weeks. Steelworks in the Midland area are short of orders and obliged to work half the week, owing to shortage of specifications. Rolling stock works have experienced reduction in demand and the year has opened quietly. They are therefore unable to place business with the local steelworks except for light sections.

In the Staffordshire finished iron trade most of the works were closed until Jan. 5 but one or two bar mills have a fair number of specifications for best bar iron. Steady demand for marked bars is a feature of this trade. Prices have been maintained throughout the past year and engineering concerns have made regular contracts for this high class material. Manufacturers of iron strip are working about three days a week, owing to uncertainty of new business but little work is being done at Staffordshire mills producing crown iron.

Midland pig iron producers have accumulated stocks, as furnaces worked through the Christmas holiday. A few orders have come in this week, generally for 20 or 30 tons at a time, but one merchant was able to send on to the furnaces contracts for 300 tons. Buyers are pursuing a hand-to-mouth policy and the experience of producers everywhere is that founders will not contract beyond January.

Scrap Trade Is Stagnant

Little buying is being done in the scrap market. Deliveries were suspended over the Christmas and New Year holiday and works will not yet take more than a truck load at the outside. Prices are low but merchants believe the lowest point has been touched and that spring will see some revival, accompanied by more remunerative prices.

In the Midland district it is still possible to find structural engineers who have their yards fully occupied. But it is all small business, accepted at cut prices to find the men work. With the new year a number of contracts have been released in connection with the electrification of the countryside, important jobs having been distributed with electrical engineering concerns in the Midlands. Steel for shipyards will not be needed until improvement sets in on the northeast coast and the Clyde.

In the Welsh tin plate trade makers are hopeful of bringing into the pooling scheme all manufacturers who hitherto have been regarded as outsiders. When this process is completed it is believed that stabilization of prices will be easy and the industry will have been set upon a sound basis. Inquiries for tin plate have come in from the Argentine and Holland but business with home consumers is not expected for a week or two. A few orders for galvanized sheets have been received by Welsh and Midland makers but they are not sufficient to employ more than half the capacity of the industry. The coal strike in South Wales came at an unfortunate moment, as several steel concerns had made arrangements to reopen with the new year, one of these being the British Mannesmann Tube Co.

New business in the Continental market is difficult to secure and Birmingham merchants have taken practically nothing in fresh business since Christmas. A good deal of uncertainty prevails as to the future.

Middlesbrough Shipments of Pig Iron at Low Mark

Birmingham, Eng.—Middlesbrough exports of iron and steel in December showed another sharp decline, particularly in shipments of pig iron to some of the near Continental customers. Germany, for instance, took only 290 tons of pig iron, compared with 2065 in November, France took only 590 tons against 2235 in November and Belgium 438 against 2765 tons. Shipments to Denmark in December were fairly maintained, the total being 2503 tons, against 2422 in November. Total foreign shipments of pig iron were 5858 tons, Denmark being the heaviest buyer. Shipments to other British ports totaled 2945 tons.

In heavy steel 19,946 tons were sent to foreign destinations and 12,288 to British ports. India bought 4204 tons, South Africa 4487, the Argentine 2382 and Portuguese East Africa 1990. Only 635 tons were sent to Australia. The total shipment of manufactured iron was 4967 tons, of which 1978 were to foreign destinations. It is not yet possible to give total shipments for the year but they are likely to touch a low level.

Japan Curtails Output of its Steel Mills

Washington—Recent information reported by Trade Commissioner William S. Dowd, Tokyo, Japan, indicates a confirmation of previous reports concerning the curtailment program of the Yawata Seitetsujo (Imperial Government Steel Works of Japan). The first curtailment, made effective in July, was in the amount of 50,000 metric tons, while the second curtailment (put into effect about Dec. 1) increased this 130,000 tons. The program for the current fiscal year has up to this time been curtailed to the extent of about 20 per cent.

The amount of actual curtailment, however, has been materially reduced by a new production program which calls for the manufacture of something like 20,000 metric tons of products new to these works, including band iron, skelp and sheet piling, the production of all of which has been under development for some time and which is now gradually assuming a commercial basis.

In addition to this increase, the Yawata Works have speeded up production of tin plate something like 300 tons a month and that of wire rods approximately 200 tons a month.

French Coke Output Up

Paris—Output of coke at French collieries in October was increased over that of September. Imports of coke into France in October fell off. Exports of coke from France in October also declined. Comparisons follow, in metric tons:

Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1927	339,015	395,580	33,430
1928	366,660	447,330	34,810
1929	397,435	453,720	39,070
1930			
Jan.	414,797	442,754	37,473
Feb.	392,950	403,887	15,905
March	443,909	385,742	11,779
April	419,348	450,437	13,371
May	426,327	386,422	21,605
June	416,992	386,359	24,333
July	427,121	352,388	40,460
August	422,526	369,741	39,947
Sept.	418,347	366,938	41,867
Oct.	431,893	351,975	39,617

Belgian Output at New Low

Brussels—Production of pig iron and steel in Belgium in November was the lowest since the flood period of 1928. The output of steel ingots, castings and rolled material in November dropped from the total of October. Comparisons follow, in metric tons:

Mon. ave.	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	....	207,055	205,550	154,920
1927	....	312,620	309,040	255,185
1928	....	325,445	327,870	281,125
1929	58	341,330	344,370	296,370
1930				
Jan.	58	343,380	340,200	296,220
Feb.	57	315,320	321,480	271,430
Mar.	57	341,820	359,150	258,770
April	56	313,250	312,550	252,150
May	54	299,510	294,160	240,900
June	51	265,290	252,680	204,590
July	49	259,750	263,980	209,060
Aug.	47	246,740	244,870	206,020
Sept.	46	250,630	254,280	202,970
Oct.	43	248,550	252,340	220,810
Nov.	44	238,780	222,210	193,570

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk	Gal.
½	58	44½	½	23	5
¾	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft. 55%
Selected lengths, 1 to 18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.....$37.00 to 38.00
Four-inch, Birmingham..... 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago..... 45.20 to 46.20
Six-inch and over, N. Y..... 37.50 to 39.50
Four-inch, New York..... 40.50 to 41.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York(d)	3.30c
Philadelphia	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	9.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.20c-3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	2.75c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev.***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York	3.55c-3.65c
Phila.*†	3.60c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.35c
Seattle	4.50c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo	4.40c-4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35c-4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York	3.35c-4.10c
Phila.*†	4.15c
Pitts.**	4.00c
Portland	5.00c
San Fran.	5.00c
Seattle	5.00c
St. Louis	4.60c
St. Paul	4.23c
Tulsa	4.60c-4.75c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.15c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL
Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 5c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.85c
New York	5.05c

(b) Net base straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras. (d) Minus quant. diff. ‡Domestic bars. *Plus quantity extras. **Less than 25 sheets. *†50 or more bundles. ***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

LARGEST BUILDERS OF THE WORLD'S LARGEST CRANES

Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

—+—

Ladle Cranes
Ingot Strippers
Soaking Pit Cranes
Open Hearth Charging Machines
Slab and Billet Charging and Drawing Machines
Gantry Cranes
Ore and Coal Bridges
Car Dumpers
Forging Manipulators
Steam Drop Forge Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

271 of 100 Tons Capacity and over

LADLE AND STANDARD CRANES

59		100 tons
2	WORM DRIVEN Ladle,	100 tons
2		115 tons
6	WORM DRIVEN Ladle,	125 tons
45		125 tons
30		150 tons
3	WORM DRIVEN Ladle,	150 tons
6	WORM DRIVEN Ladle,	160 tons
2	WORM DRIVEN Ladle,	165 tons
4	WORM DRIVEN Ladle,	175 tons
27		175 tons
3	WORM DRIVEN Ladle,	200 tons
4		200 tons
5		225 tons
1		250 tons
3	WORM DRIVEN Ladle,	250 tons
3	WORM DRIVEN Ladle,	275 tons
1		275 tons
1		300 tons
3		430 tons

STRIPPING CRANES

8		100 tons
1		125 tons
21		150 tons
19		200 tons
1	Single Ram,	320 tons

COMBINATION CHARGERS AND STRIPPERS

3		100 tons
1		125 tons
3		150 tons
4		200 tons

Give Us the Runway and We will Lift the World

THE ALLIANCE MACHINE CO.

ALLIANCE, OHIO, U.S.A.
ENGINEERS AND BUILDERS

Canonsburg Steel & Iron Works

Canonsburg, Pa.

BLACK and GALVANIZED SHEETS

Single Pickled—Full Pickled and Full Cold Rolled
JAPANNING STOCK—"CANONSBURG" Mirror Blue Stove Pipe Stock

FORMED ROOFING PRODUCTS
"CANONSBURG" COPPER BEARING SHEETS

Nearest Sheet Mill to Pittsburgh

HOT AND COLD ROLLED — WILSCO — STRIP STEEL

SAVE WITH STEEL

Hot and Cold Rolled Strip Steel

For All Purposes $\frac{3}{4}$ to 24 Inches Wide

QUALITY *and* SERVICE

WEST LEECHBURG STEEL COMPANY

General Offices: Farmers Bank Building, Pittsburgh, Pa.

NEW YORK—50 Church St.
NEW ENGLAND—43 Farmington Avenue Hartford, Conn.
PHILADELPHIA—Edgcomb Steel Co., D Street below Erie Ave.
CHICAGO—1153 Peoples Gas Bldg.
NEWARK—Edgcomb Steel Corp., 350 Frelinghuysen Ave.
DETROIT—5-255 General Motors Bldg.
TOLEDO—Dean Higgins & Co., 906 Ohio Bldg.
CINCINNATI—1707 Union Central Bldg.
ST. LOUIS—1413 Chemical Building

WAREHOUSE STOCKS of Cold Rolled Strip Steel are carried by
EDGCOMB STEEL CO., Philadelphia — EDGCOMB STEEL CORP., Newark — JOS. T. RYERSON & SON, Chicago

Machinery

RISING volume in sales of small tools and of used and rebuilt equipment is interpreted by experienced machine tool men as meaning that a distinct increase in volume of new machine tool business can be expected to follow. As yet there has been no general releasing of orders on the part of large users of machine tools, but a certain amount of optimism is due to the fact that several of the large users have budgeted considerable money for new equipment and are throwing out feelers to test the market. Engineering improvements are expected to share with general business recovery in precipitating substantial equipment purchases.

New York—Improvement in machine tool buying and inquiry continues. While nothing in the nature of a spurt is noted, volume since the first of the year has been slightly heavier and some fresh inquiry has developed. A more optimistic feeling prevails among machine tool builders and dealers, although most of them agree that recovery will be gradual. Sales generally are limited to one or two tools at a time. A considerable portion of the business placed may be traced to old inquiries only recently released. Buying is well spread. No large new lists are out but inquiries are being received for individual units from sources which have long been inactive. Engineering details and improvements are also a factor in selling.

The slight gain in orders has not been reflected to a marked degree in operations at machine building plants, shops forces still being curtailed. Railroads are not buying and few expect much volume from carriers this year. A number of sales made thus far in the year can be traced to fabricating and other metalworking plants recently successful in booking attractive orders in their respective fields. Box Crane & Hoist Co., Philadelphia, has been awarded the contract for electric and hand-operated hoists for Coco Solo, C. Z., the bureau of yards and docks, navy department, having accepted a bid of $6081.

Pittsburgh—Inquiries for machine tools continue at the improved rate noted since the first of the year. Sellers are busier figuring on new work than they are in taking orders, which continue rather light, but they look for better buying later in the quarter. Inquiry is well distributed and while it includes no large lists, it indicates more general interest of tool users in new equipment. Orders include several tools for the Jones & Laughlin Steel Corp. for its northern ore properties.

Cleveland—Signs of recovery in the industrial equipment market are becoming increasingly apparent, particularly in the field of small tools. Sales activity in taps, dies, twist drills, milling cutters, etc., always is looked upon as presaging early activity in machine tool lines. Increasing sales of used and rebuilt machine tools is another sign which is interpreted by experienced machine tool men as a forerunner of a rising index of new equipment sales.

Salesmen are sending in plenty of projects for quotation and with them a few real orders. This business primarily is coming from companies which make parts for the automotive industry. Not only have these companies been stimulated into activity by the resumption of automobile production in the Detroit district, but they are being stimulated by low bids on parts and accessories to find more economical means of production. That condition offers splendid opportunities to machine tool builders who have brought out important improvements during recent months, and their sales departments are seizing these opportunities.

Russian business continues to be an important factor in Cleveland, substantial increases having been made to such orders within the last few days. In spite of the rising degree of optimism, and the undoubted improvement in business, unemployment has not been relieved to any large extent and it probably will continue to be a serious problem for many weeks to come.

Chicago—Straggling inquiries and purchases from the western railroads provide the chief activity in the local machine tool market. January sales thus far are a shade better than December, but fail to represent a definite upward trend. Santa Fe, supplementing its inquiry for a 24-inch wheel grinder, is asking bids on a 36-inch shaper, 48-inch draw-cut shaper, small crane, portable cylinder and valve chamber boring machine, four crankpin turning machines, two cut-off saws, quartering and pin-turning machine, two arc-welders, and some woodworking tools. Burlington has made some purchases against its recent list, and Chicago, Great Western will buy several tools next week.

A Grand Rapids, Mich., industrial buyer placed a large shear in this market, and several presses and light production tools were purchased by local concerns. Industrial inquiries are light. Possibilities of purchases in the near future by western tractor makers seem remote. There is some activity in the crane market in this district, Harnischfeger Sales Corp., Milwaukee, having been awarded an order for a 300-ton two-trolley crane for the Diablo power project of the Seattle light department, while award on a 30-ton crane for the Port of Willapa Harbor, Wash., has been made to a Huntington, Ind. company.

Chicago Machine Tool Distributors' association has filed answer to the federal trade commission's inquiry into the so-called Chicago appraisal plan for used tools. The distributors' association itself asked for the federal trade commission's opinion.

Worcester, Mass.—Outside of some reported activity in textiles, demand for machinery remains light. It is believed that resumption of automobile production will not materially affect the machinery market in New England for several months. Grinder business continues quiet, with but little export trade. Navy specifications are affording some inquiry.

Canadian Census Shows 1929 Manufactures Lead

Dominion bureau of statistics reports that production of machinery in 1929 was valued at $65,692,539, compared with $51,046,140 for the previous year. There are 169 plants engaged in the industry with an aggregate capital of $75,226,302, employing 12,435 persons, who received in salaries and wages $17,091,918. Cost of material was $22,264,416 and value added by manufacturing $43,428,135.

Production of the hardware and tool industry was valued at $27,658,312, compared with $25,151,521, in 1928. The 127 plants engaged in the industry had a total capital of $37,334,436, and employed 7,257 persons, who received in salaries and wages $8,417,835. Wire and wire goods were produced by 60 plants to the value of $21,647,273, compared with $18,847,346 in 1928. The total capital invested was $37,258,215, and 4190 persons were employed, who received in salaries and wages $5,094,656.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

NORWICH, CONN.—Engine and generator for a power plant will be purchased by the Norwich state hospital. Cost is estimated at $25,000.

BINGHAM, ME.—Central Maine Power Co., subsidiary of the National Electric Power Co., 57 William street, New York, will build the second and third units of a hydroelectric plant here. Cost of the entire project is estimated at $1,000,000.

OAKLAND, ME.—Getchell Foundry & Machine Works recently was damaged by fire. Loss is estimated at $75,000.

ASHLAND, MASS.—John A. Dunn Corp. has been incorporated with $200,000 capital by Clyde G. Lewis, Ashland, and John A. Dunn, Gardner, Mass., to engage in wood and steel manufacturing.

SPRINGFIELD, MASS. — Granville Brothers Aircraft Inc., Springfield airport, advises through Z. D. Granville that the company will not build a plant, as recently reported. (Noted Jan. 8.)

WESTFIELD, MASS.—Planet Mfg. Co. has been organized here by Robert Gowdy, president, and P. N. Hall, 80 Elm street, to operate a plant for the manufacture of household tools, utensils and mechanical equipment.

YARMOUTH, MASS.—City council, recently noted as planning extensions to waterworks, advises that the council has authorized $75,000 for the project, which will include a water tower and about three miles of pipe. J. E. Hoover, chairman, water board, Yarmouthport, Mass., is in charge. (Noted Jan. 15.)

DOVER, N. H.—Public Service Co. of New Hampshire, A. R. Schiller vice president, Manchester, N. H., will build a substation here. Plans are being prepared. Estimated cost, $165,000.

PORTSMOUTH, N. H.—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 27 for two motor-driven, hand and power feed millers, for delivery to the navy yard here.

New York

BINGHAMTON—Airplane Wheel & Rim Corp. has been incorporated with $100,000 capital by Couper, Terry & Turnbull, attorneys.

BROOKLYN—Metropolitan Coal Stoker Corp. has been incorporated with $50,000 capital by Orr & Brennan, 16 Court street, to deal in coal stokers.

BROOKLYN—Bureau of supplies and accounts, navy department, Washington, will receive bids Feb. 3 on schedule 4944 for arc welding sets and spare parts, for delivery to the naval supply depot here.

BUFFALO—Electro Alloys Inc., 66 Andrews building, whose incorporation recently was noted, advises through L. U. Milword, president, that operations are under way in a portion of the plant of the Electro Refractories Corp. but that a plant will be built in the spring. Company produces copper, nickel and aluminum alloys. (Noted Jan. 15.)

NEW YORK—Consolidated Telephone & Electric Subway Co., 140th street and Harlem river, has filed plans for a 1-story machine shop, 32 x 108 feet. Approximate cost, with equipment, $25,000.

NEW YORK—Lindquist Metal Weather Strip Co., whose incorporation recently was noted, advises through Joseph Danziger, attorney, 69-03 Fresh Pond road, Ridgewood, New York, that the company is now placing orders for machinery and will be equipped for manufacturing purposes within four to six weeks. Products will be composed of brass, bronze and zinc, principally the latter. (Noted Jan. 15.)

SCHENECTADY — General Electric Co. will build a generating plant which will be leased to the New York Power & Light Corp. Cost is estimated at $4,000,000. B. L. Delack is manager of the Schenectady works of General Electric Co.

Pennsylvania

PHILADELPHIA—Philadelphia Range, Boiler & Steel Tank Co., 2656 Salmon street, has acquired a plot of 160,000 square feet at Salmon street and Lehigh avenue.

PHILADELPHIA—Barrett Co., Thirty-sixth street and Grays Ferry avenue, will erect a group of buildings, to include storage and machinery units. Plans are private.

PHILADELPHIA—Union Special Machine Co., 400 North Franklin street, Chicago, has leased 5000 square feet of floor space at Broad and Callowhill streets for warehouse purposes.

PHILADELPHIA — Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 27 on schedules 4934 for high speed steel drills and countersinks, for delivery to the navy yard here.

READING—Plant of the Reading Sheet Metal Products Co. recently was damaged by fire, with loss estimated at $40,000. Company manufactures automobile supplies.

WILKINSBURG—Calorizing Co. advises through D. T. Downes that addition to present foundry to be built by the Austin Co., Cleveland, will be 95 x 132 feet, with a 50 x 90-foot unit for pattern storage. (Noted Jan. 15.)

New Jersey

BRIELLE—Feuerbach & Hansen Inc. has been incorporated with $125,000 capital by David Sarbone, 211 Hillside avenue, Newark, N. J., to manufacture outboard motor boats.

NEWARK—Dexall Mfg. Co. has been incorporated with 2500 common shares by John Gusmano, 321 Broadway, New York, to manufacture heating apparatus.

Ohio

CLEVELAND—Universal Spring & Mfg. Co. has been incorporated with 250 no par shares by A. R. Edgerton, 1019 Williamson building.

CLEVELAND—Hamilton Steel Co. has been incorporated with 500 no par shares by Paul F. Colebrook, 2508 Terminal Tower building.

CLEVELAND—Motor Saver Corp., 5005 Euclid avenue, has been acquired by Frank S. Wright, who will become president. Company will expand operations for the production of a motor device. G. A. Bartholomew will be general manager.

CLEVELAND—Sun Oil Co., 841 Society for Savings building, has let contract to H. L. Vokes Co., 14250 Euclid avenue, for a warehouse, boiler room and other units, to be located at 3354 Independence road. W. A. Courtney, 1608 Walnut street, Philadelphia, is engineer.

COLUMBUS—Midland Furnace Co., 1649 River road, in a merger with the Success Heater Mfg. Co., Des Moines, Iowa, will double output within two months. Manufacturing will be confined to the local plant. W. S. Michael is president of the Midland company.

ELYRIA—Elyria Foundry Co. has plans for a foundry unit, 113 x 363 feet, with crane runway. E. C. Hoffer, 5005 Euclid avenue, Cleveland, is architect.

NAPOLEON—Pressed Products Co., recently organized, is preparing to start operations about Feb. 1 in a remodelled building. A portion of the equipment is being installed for the manufacture of electrical appliances and hardware. Employes at the start will number 25. R. E. Dalton, Parkersburg, W. Va., will be manager.

TOLEDO — International Harvester Co., 606 South Michigan avenue, Chicago, plans to build a one and 2-story warehouse and plant unit, providing 100,000 square feet of floor space, on a site of 2½ acres. Present plant will be taken over by National Supply Co., July 1. Cost of the new plant is estimated at $300,000.

Indiana

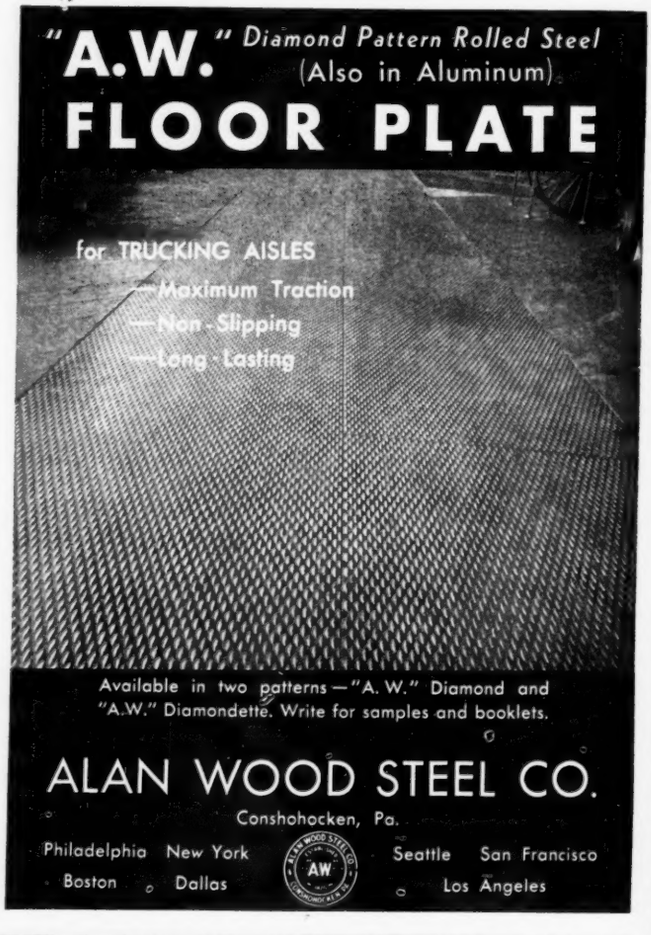
MISHAWAKA—S. & H. Foundry Co.,

CARNEGIE FLOOR PLATE

Section M-41
Thickness—$\frac{3}{16}$" to $\frac{3}{4}$" exclusive of raised figure.
Width —6" to 66".
Weight —8.8 to 31.7 pounds per square foot.
Recommended for floors, sidewalk openings, stair and traffic treads, where a safe, secure foothold is required. This design drains and cleans easily.

CARNEGIE STEEL COMPANY
Subsidiary of UNITED STATES STEEL CORPORATION
CARNEGIE BUILDING, PITTSBURGH, PA.

At the Bottom of Every Well Laid Safety Plan
Central "Knobby" Non-Skid Floor Plates guard life and limb from the dangers of slip-fall accidents,----and protect against the high Maintenance costs of wood, concrete and tile floors. Let us send you a sample and tell you about their many advantages.
Central Iron & Steel Co.
HARRISBURG, PENNA.
REG U.S. PAT. OFF.
Branches in all Principal Cities
Underwriters' Laboratories Inspected S. A. 443
"KNOBBY" NON-SKID
CENTRAL FLOOR PLATES



INGOT-MOULDS

Direct or Cupola Metal—All Shapes and Sizes

VALLEY MOULD AND IRON CORPORATION

Western Offices:
108 St. and Calumet River
South Chicago, Ill.

Main Office—Hubbard, Ohio

Plants:
Hubbard, Ohio
Sharpsville, Pa.
South Chicago, Ill.

"The Largest Manufacturers of Ingot Moulds in the World"

2202 Lincoln Way west, advises through A. C. Scherrer that the company has purchased the equipment and location of another foundry for the manufacture of aluminum, brass and bronze castings. (Noted Jan. 15.)

MARION — Commonwealth Holding Corp. has secured a plant at Thirteenth street and will begin manufacturing electrically operated flexible steel doors within one or two months. Machinery has been purchased. M. F. Kennedy, Franklin, Ind., is president and G. E. Stevenson, inventor of the door, is secretary. Approximately 25 employes will be required for initial operations.

Michigan

BAY CITY — Industrial Brownhoist Corp., Alexander C. Brown president, 4403 St. Clair avenue, Cleveland, will concentrate manufacturing operations at its plant here, discontinuing its Cleveland plant within about eight months.

BAY CITY—Consumers Power Co., Samuel Ball district manager, has acquired options on 91 acres on the Saginaw river here and proposes a steam electric generating plant with 500,000 horsepower capacity. Maturity is unlikely for a considerable time. Main offices of the company are at Jackson, Mich.

DETROIT—Board of water commissioners will receive bids about Feb. 25 for construction of boiler house and generator house, machine shop and garage, to be located at 8100 West Warren avenue.

DETROIT—Michont Air Tours Inc. has been incorporated with $50,000 capital by Kenneth G. Hathaway, 2842 West Grand boulevard, to manufacture and sell aircraft, aircraft parts and supplies and to conduct air tours.

DETROIT — Aircraft Development Corp., 3400 Union Trust building, division of Detroit Aircraft Corp., may proceed with the construction of an all-metal airship for the United States war department, and set up metal working facilities. Action is pending on advance development of plans. Cost of the airship is estimated at $4,500,000.

FLINT—Barton-Packer Co. Inc., 214 West Second street, has been incorporated with $6000 capital by John W. Barton to manufacture and sell vulcanizing machinery.

LANSING—New Way Engine & Machine Co. has been incorporated with 30,000 no par shares by C. D. Woodbury, 422 Townsend street, to engage in the business of mechanical and electrical engineers and toolmakers.

LANSING—Ransom E. Olds is reported to have acquired the Ryan-Bohn foundry property here, from Charles B. Bohn, 8162 East Jefferson street, Detroit, trustee. Plans for operation or disposal of the plant are indefinite. Total floor space of all units amounts to about 26 acres.

Illinois

CHICAGO—Corn Belt Machinery Co., 1028 South Washington street, has been incorporated with 200 no par shares by George M. Silverstein, 314 Central National Bank building, to deal in machinery.

CHICAGO—Electric Rotary Machine Mfg. Co., 3246 West Lake street, has been incorporated with $30,000 capital by Osborne, Kline & McGurren, 110 South Dearborn street, to deal in rug cleaning and floor surfacing machines.

Southern States

BIRMINGHAM, ALA.—Dixie Fire Brick Co. Inc., 723 Woodward building, is inquiring for a shaper for its machine shop.

BIRMINGHAM, ALA. — Stockham Pipe & Fittings Co., 4100 Tenth avenue north, is reported to have secured 53 acres adjoining its East Birmingham plant, as a site for future expansion.

BIRMINGHAM, ALA.—Alabama Power Co., Thomas W. Martin president, Brown-Marx building, is reported to plan expenditure of $10,000,000 in 1931 for construction and operations.

MERCER, KY.—Pacific Coal Co., Louisville, Ky., proposes to rebuild its generating plant here, recently damaged by fire with loss estimated at $25,000.

OWENSBORO, KY.—City council plans to install boiler equipment at the municipal light and power plant.

SHREVEPORT, LA.—J. B. Beaird Corp., recently noted as erecting additional plant units, advises through E. F. Dunkle, manager of the structural division, that equipment and machinery have been secured. (Noted Jan. 15.)

BALTIMORE — Baltimore Body Corp., Albert W. Grimmer secretary, 3309 Virginia avenue, is investigating sites for a plant for the manufacture of bus bodies and refrigeration truck units. Company has established temporary headquarters at 2844 West Garrison avenue.

COLUMBIA, MISS.—McDorgan-Phillips Packing Corp., Mobile, Ala., will build plant units here for canning, to include a 1-story machine shop and boiler house. Contract has been awarded to Dye and Mullins. A. J. Kessler, chief engineer in charge, is located at the Mobile office. Cost is estimated at $85,000. (Noted Dec. 4.)

ABERDEEN, N. C.—H. H. Page Sr. is inquiring for gravel crushers, to handle 50 to 70 tons hourly.

NORFOLK, VA.—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 27 on schedule 4946 for one motor-driven compressor, without motor. Bids will be received Feb. 3 on schedule 4964 for electric furnaces and for three corrugated furnaces for Scotch boiler. Bids will be received Feb. 10 for delivery to Hampton Roads, Va., for two oil-fired low pressure boilers and parts.

CHARLESTON, W. VA. — Kelly Axe & Tool Co., division of American Fork & Hoe Co., plans to establish a shovel manufacturing plant and erect additions to its local works. Machinery has been purchased.

Missouri

INDEPENDENCE—City will purchase a steam turbine as a part of power plant improvements recently noted. Cost is estimated at $25,000. (Noted Aug. 21.)

Oklahoma

OKLAHOMA CITY—Motor Parts & Machine Co. is reported to have leased a building at Seventh street and Harvey avenue, and to plan installation of $50,000 worth of machinery.

Texas

AUSTIN—Emery, Peck & Rockwood Development Co., Scarborough building, will receive bids for construction of a power project on the Colorado river. Eventual cost will total $9,000,000, according to reports. Construction will take more than two years.

BEAUMONT—O. P. Sawyer, Grand and Long streets, plans a development here which will require a light plant and hydraulic turbine. A. Babin, Perlstein building, is engineer.

BROWNSVILLE—City, Z. A. Rosenthal city manager, will receive bids Jan. 30 for superheater and mechanical equipment for boiler plant. L. D. Royer, Smith-Young Tower, San Antonio, Tex., is consulting engineer.

EL PASO—El Paso Electric Co. proposes to make improvements in its power plant at a cost of about $260,000.

HOUSTON—Southwestern Can Co. advises that contract has not been let for a new plant unit, as plans as to the type of building have not been completed. (Noted Jan. 15.)

HOUSTON—L. L. Walker, 519 West Eighteenth street, has leased a machine shop recently completed on Bray's Bayou by E. M. Biggers and will specialize in marine repairs to pleasure boats. Installation of a craneway for handling of boats is planned.

HOUSTON—Harry K. Johnson, 2510 Wichita street, is head of a company planning construction of an interurban line from Houston to Port Arthur, Tex., a distance of 87 miles. Estimated cost is $6,000,000, including terminals and shops.

SAN ANTONIO—Comal Machinery Co. has been organized with $20,000 capital by Charles DuBose, 335 West Ellsmere street.

SAN ANTONIO—Office of the com-

manding officer, San Antonio air depot, advises that machine shop and other construction is entirely in the hands of the quartermaster general of the army, Washington. (Noted Jan. 15.)

Wisconsin

LA CROSSE—La Crosse Boiler Co. will manufacture tractors and engines formerly produced by Townsend & Co., Janesville, Wis.

WISCONSIN RAPIDS — Transformer Converter Co. has been organized by W. F. Anderson and I. W. Kureth, to make an electric arc-welding machine.

WEST BEND—City council has authorized a bond issue of $36,000 for waterworks extensions, to include a pump house, 18 x 24 feet, to be equipped with new machinery. C. P. Heipp is city clerk.

Minnesota

MINNEAPOLIS — Northwest Automatic Products Co., 138 Holden street, manufacturer of bolts, dies and other products, plans to build a 1-story plant on Fourth street. Martin G. Lindquist, Security building, is architect. Unit will be 85 x 88 feet, and will cost, with equipment, $40,000.

Iowa

DES MOINES—Boiler and power equipment and oil burners will be purchased by Newens-Northland Milk Co.

Pacific Coast

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids Feb. 3 on schedule 4953 for three electric radial drills, to be delivered to the navy yard here.

SAN DIEGO, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids Feb. 3 on schedule 4935 for one motor-driven hand milling machine, for delivery to the naval air station here.

EUGENE, OREG.—City has awarded contract to Hargreaves & Lindsay for construction of a power house and other facilities. Estimated cost, $25,000.

PORTLAND, OREG.—Oregon Brass Works has sold its Linton road foundry to the Magnus Co. Inc. and has plans for a new plant on property recently purchased at East Ninth and Salmon streets. Manufacture of railroad brass articles will be discontinued by the Oregon Brass company but will be taken up by the Magnus company.

CHEHALIS, WASH.—Backus-Brooks Co., 1100 Builders Exchange building, Minneapolis, may build a hydroelectric power plant on the Cowlitz river, near here. Cost is estimated at $3,000,000.

CHEHALIS, WASH.—Cowlitz, Chehalis & Cascade railway, W. E. Brown president, has reopened the company's car and repair shops here, for rebuilding operations.

SEATTLE — Machinery & Supply Corp. of America has been incorporated with $75,000 capital by J. B. Alexander, attorney, White building.

SEATTLE — Equipment to include three 200-horsepower synchronous motors and twelve smaller motors will be purchased by the White River Lumber Co.

Dominion of Canada

EDSON, ALTA.—Calgary Power Co., Insurance Exchange building, advises through H. J. McLean, superintendent, that plans are in the preliminary stage for a power project on the Athabaska river, near here. A survey will be made next summer to determine the possible size of a power site. (Noted Jan. 8.)

CHURCHILL, MAN.—J. W. Pugsley, secretary of the department of railways and canals, Ottawa, Ont., will receive bids Jan. 27 for the construction of power plant units here. C. D. Howe & Co., Whalen building, Port Arthur, Ont., are engineers.

GANANOQUE, ONT.—Carl H. Frink, manufacturer of snow plows, Clayton, N. Y., may establish a plant here next summer, plans being indefinite at the present. Reports concerning acquisition of the plant of the Gananoque Spring & Axle Co. have been denied.

OWEN SOUND, ONT.—Owen Sound Motors Ltd. has been incorporated with $40,000 capital by William P. Telford and John F. P. Birnie, to deal in motors and machines.

OSHAWA, ONT.—Vitreous Corp., 114 Jarvis street, Toronto, Ont., whose incorporation recently was noted, advises that the company will take over the business of Mastin & Spademan. Plant to be built here will be started in February. Output will be 600,000 square feet of enameled sheets per year. (Noted Jan. 15.)

TORONTO, ONT.—Leland Electric Co., 1501 Webster street, Dayton, O., advises that drawings are being made at Dayton for equipping manufacturing space recently noted as leased here. Operations will be started as soon as possible. (Noted Jan. 15.)

JOLIETTE, QUE.—City council proposes to install a filtration plant, to cost $82,000 with equipment. Crepeau & Hunter, 1010 St. Catherine street west, Montreal, Que., are engineers.

MONTREAL, QUE.—American Can Co. Ltd., 2065 Jeanne D'Arc street, is reported to be considering erection of a new plant here. Site is to be secured, but construction plans are indefinite.

New Trade Publications

LUBRICATION—Alemite Corp., 2646 North Crawford avenue, Chicago, devotes the current number of its house organ on lubrication to application of its products in industry, with particular reference to centralized pressure units.

HEATING FURNACES—Ryan, Scully & Co., Philadelphia, has issued a bulletin, No. 5, on its portable box-type electric heating furnaces in two types. Illustrations and diagrams supplement the text and full description of the appliances and operation is given.

PNEUMATIC PAINT BRUSHES—Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, in bulletin H-30 illustrates and describes its appliances for painting with air pressure as an economical and efficient method. Specifications and descriptions are included.

BUCKETS—Single-line buckets suitable for use with cranes, hoists, derricks, etc., are described in an illustrated bulletin from the Blaw-Knox Co., Pittsburgh. Drawings, specifications, and illustrations of typical uses are included, with notes on operation and construction. Ingot tongs, foundry buckets, and dumping buckets also are described and illustrated.

STEEL EQUIPMENT—Angle steel Stool Co., Plainwell, Mich., manufacturer of steel and sheet metal equipment for factory, shop and office, is distributing its catalog M-S 1931. It covers the company's complete steel equipment line, with the addition of about 30 new patterns created to meet recent demands. Illustrations, detailed descriptions and prices are included.

STEEL GAS LINES—Bulletin No. 510 has been issued by the A. O. Smith Corp., Milwaukee, superseding a similar bulletin issued in 1927 and furnishing a wealth of new information and data on steel pipe gas lines, gathered in the interval. It covers the new way of designing and building gas lines with welded pipe. The bulletin is divided into three sections. The first deals with planning and engineering, showing methods of determining the minimum cost. The second is devoted to field work and is illustrated by halftones of actual work and of problems in line laying. The third covers engineering data on Smith pipe, with tables and graphs.